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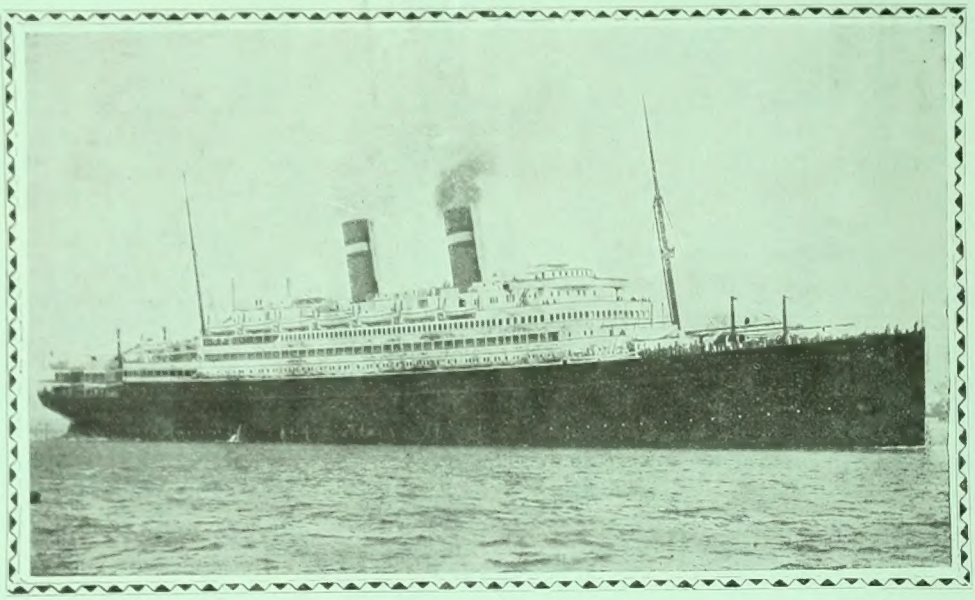

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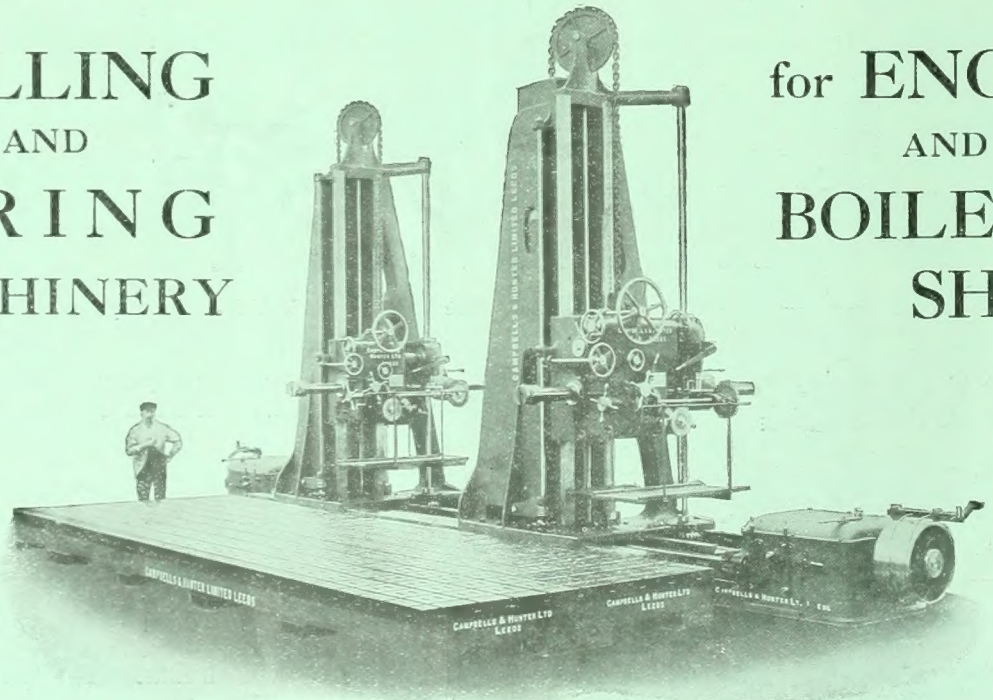

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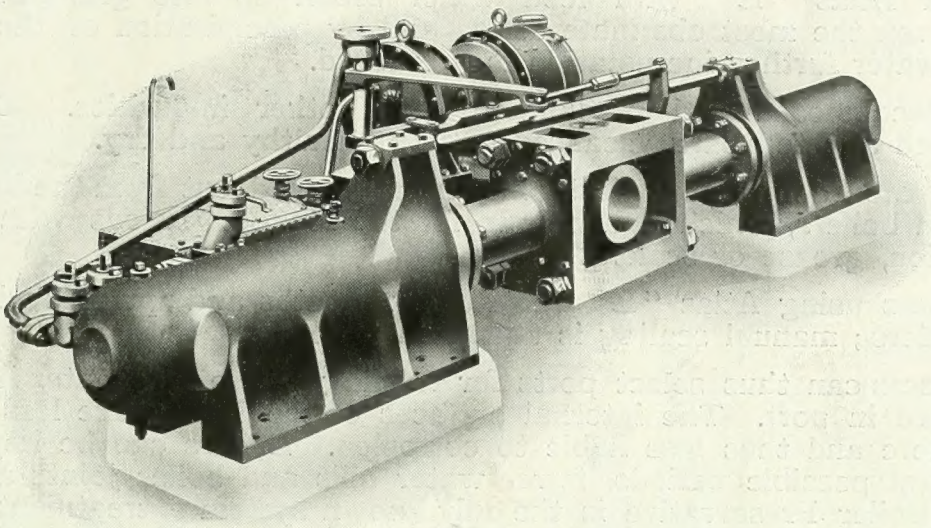

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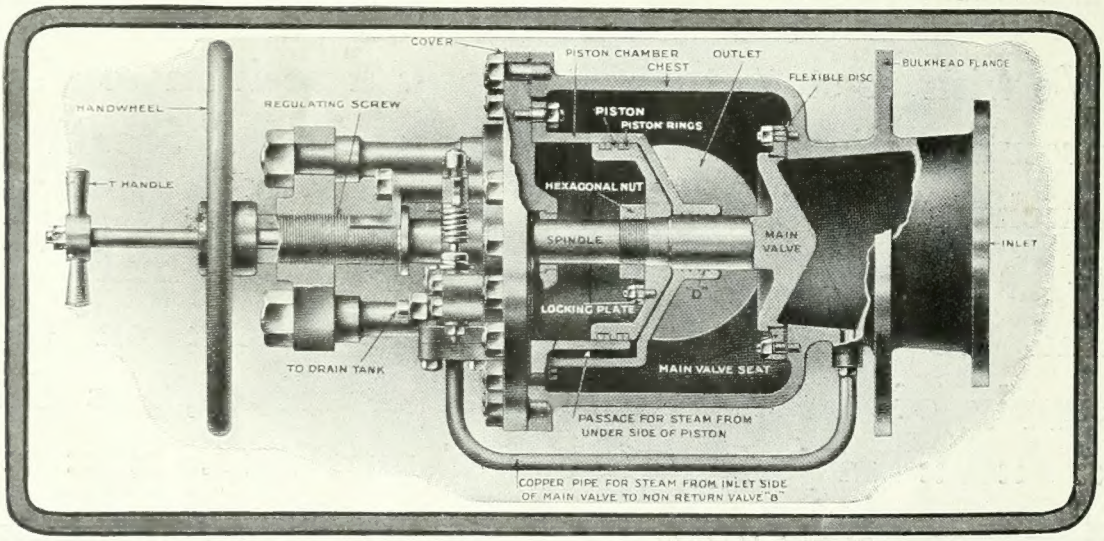

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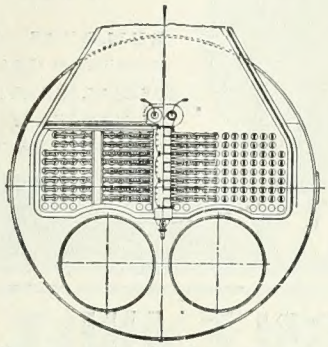

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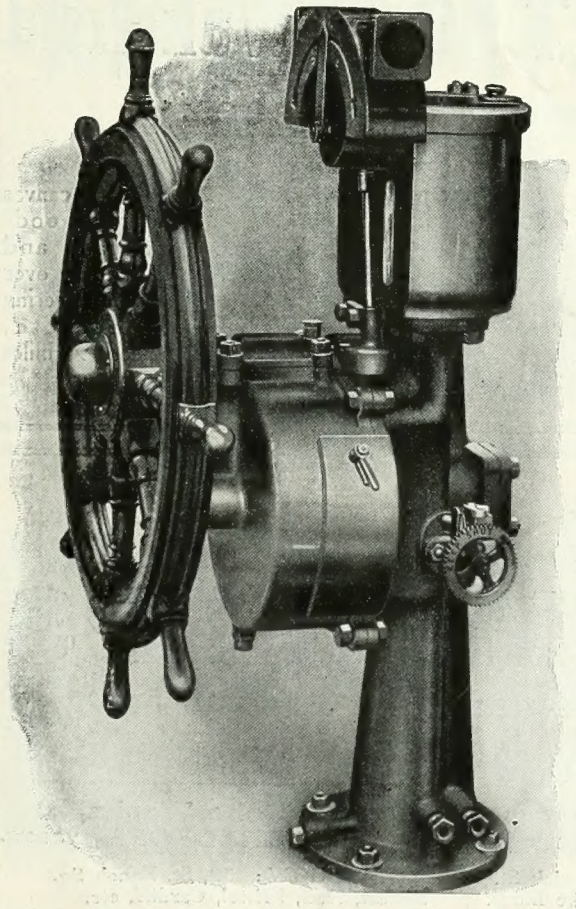

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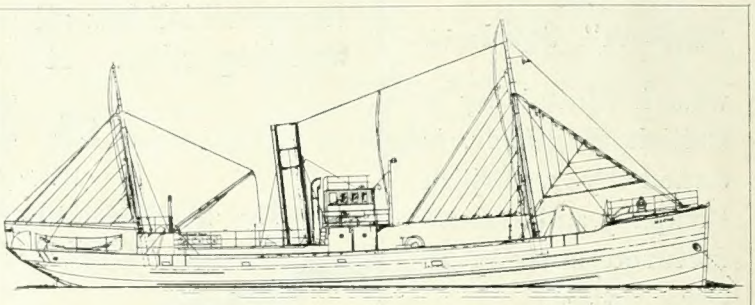

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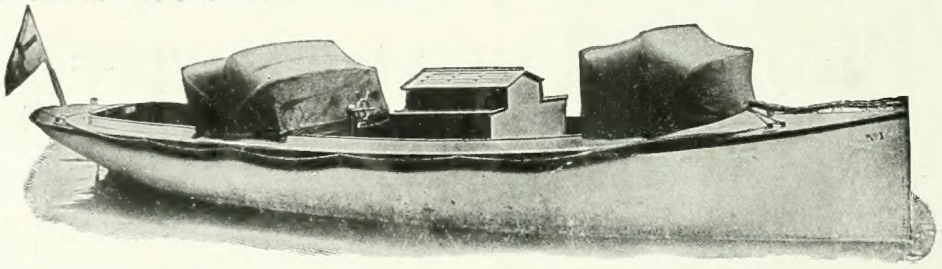

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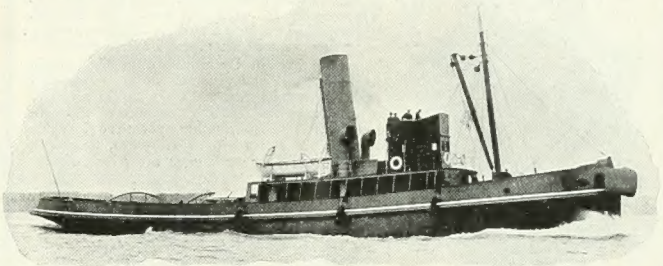

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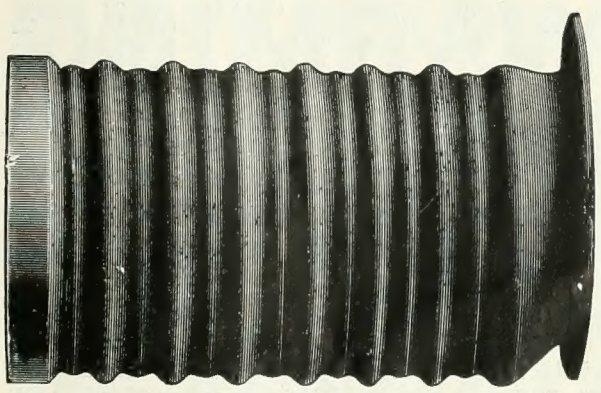

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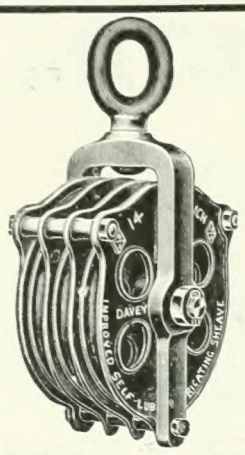

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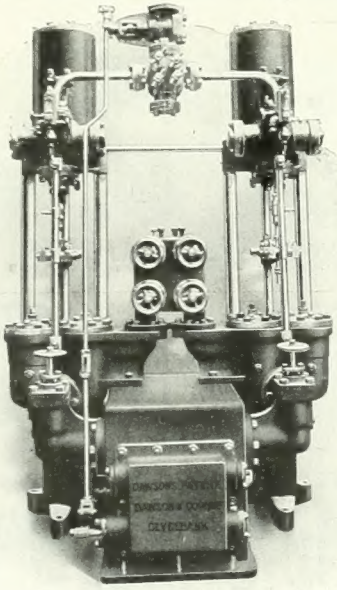

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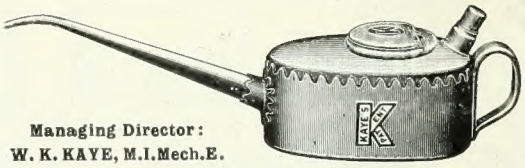

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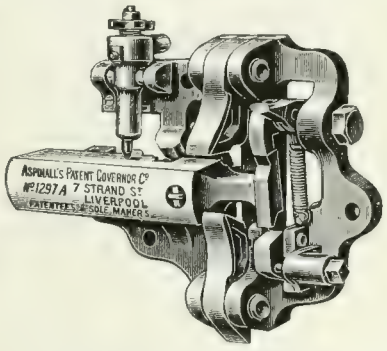

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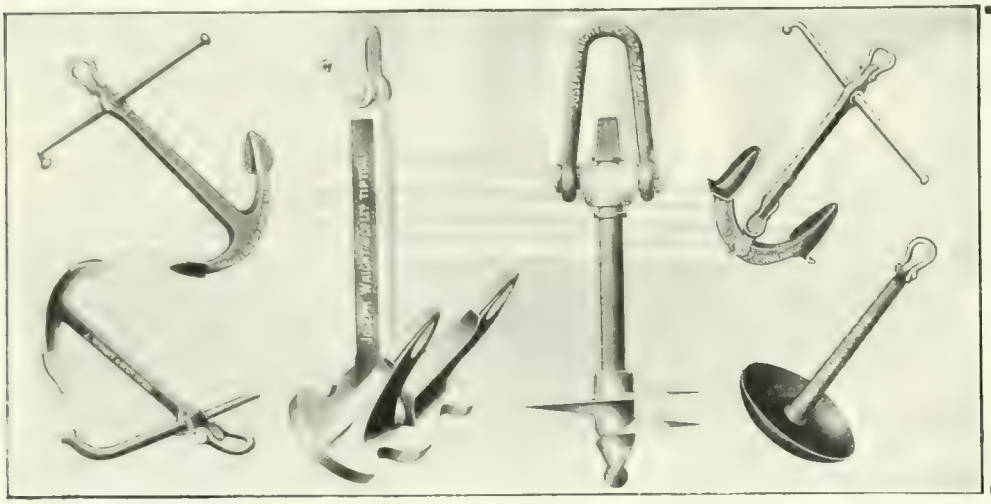

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American Seamen's Act.

UNTIL a few days ago there was an impression in shipping circles particularly on the other side of the Atlantic, that the United States Government intended to amend or abrogate the Seamen's Act, as the result of strong representations by foreign maritime countries and American shipping interests. It is now understood, however, that the measure will take effect on November 4 next in the case of American vessels, and as regards foreign ships in the following March. There will thus be no change of policy on the subject, and the future alone will decide what effect the Act will have on the United States mercantile marine. As to this, the Pacific Mail Steamship Company, which has just sold its five trans-oceanic steamers to the Atlantic Transport Line for, we believe, about £1,400,000, has no doubt; and it is said on more doubtful authority, however, that the Great Northern Company, which also maintains a service between North America and the Orient, the only two, in fact, will probably transfer its fleet to China. In order to comply, if possible, with the requirements of the new law, which among other things stipulates that 75 per cent. of a crew in all departments must understand "any order" given by their officers, the former concern attempted to teach their Chinese employees English, but the experiment showed that it was impossible of accomplishment. The State Department, Washington, has already notified twenty-one Treaty Powers of the revision of certain provisions of their commercial agreements which conflict with the Seamen's Act, but some of the Governments concerned, notably those of Great Britain, France, Spain and the Netherlands, have protested against the changes in question, their special objection being, we understand, to the elimination of the clause under which deserting seamen are caught by the American police at the request of a shipmaster or Consul. After March next entire crews may leave their vessels with, so far as the American authorities are concerned, no attempt at prevention.

The Tonnage Problem.

Reference has already been made in these columns to the negotiations, which we understand are proceeding satisfactorily, between Sir Robert Borden, the Premier of Canada, and the Imperial Government, with a view to the release of a number of vessels from war service for the purpose of carrying the Dominion's new grain crop to Europe. A serious shortage of tonnage is also retarding exports from Australasia, and is particularly felt on the Transpacific routes, where the Japanese steamship lines are making the most of the situation. Other trades, too, are experiencing a similar difficulty, and in the West Indies especially, notably in Jamaica, the situation is causing great anxiety. In fact, strong Government action may be necessary soon, if conditions do not improve, and this is, indeed, unlikely. The main Jamaican trouble arises from the fact that the colony's principal commodity, bananas, is perishable. To a very large extent they have been wasted, which is all the more regrettable seeing that the crop has been a record one, both as regards quantity and quality. True, the situation has been somewhat relieved by the Imperial Government in arranging transport facilities for some of the surplus sugar stocks, but this benefit to the island as a whole is small, as sugar occupies a comparatively insignificant position in the bulk of the colony's exports. In this connection there are, unfortunately, complaints from all our overseas possessions, and for this state of affairs it is not easy to indicate a remedy, although the problem will have to be faced by the responsible authorities sooner or later. A modified and temporary system of State control, with compensation for loss through interference with regular trades, would probably be the best way out of the difficulty.

Conversion of Kilos.

In the quarterly report of the British Steamship Owners' Association a case is cited where a vessel recently carried a River Plate cargo under a charter which was on the Chamber of Shipping River Plate form and provided for delivery at Valencia at a freight "per ton of 2,240 lb. English gross weight delivered" which charterers guaranteed to pay in London. The bill of lading weights were, as usual, given in kilos. The stevedoring, stowage and freight commission accounts rendered by the charterers in connection with the cargo were all based on the footing that 1,015 was the proper divisor for converting kilos. into tons. The freight on this cargo was computed on this basis and was paid by the charterers without demur at the time. It was not until about a fortnight later that they, for the first time, set up a contention that the divisor for the freight calculation ought to have been 1,016 and not 1,015, on the ground that arithmetically an English ton of 2,240 lb. contains 1,016·047 kilos. The charterers accordingly claimed to be repaid £22 18s. 2d. as freight overpaid on the basis of 1,015 kilos. to the ton. The owners, however, contended that in practice 1,015 is taken as the divisor and that the practice is the world over, Germany excepted. The owners, therefore, maintained that they had no concern with English arithmetical rules in the present connection and claimed that they had not been paid any more freight than was due to them. On the question of custom, the owners had proof that in all previous River Plate fixtures they had had with the same charterers they had been paid freight on the footing of 1,015 kilos. to the ton and had been charged by them for stevedoring, stowage and freight commission on the same footing. As the charterers

Demurrage and Overcharges.

Attention is also drawn to the Association's quarterly circular referred to in the preceding note, in a case which raises the question of demurrage and charges in charterers' accounts. The case is that of the ss. *Victoria*, at Nicolaieff, and it arose in 1907, the owners' claim being for Rs. 3,835·50. The greater portion of the claim was in respect of demurrage incurred in loading a cargo of grain at Nicolaieff, the balance being in respect of overcharges in the accounts of the charterers, who also acted as the ship's agents. The charterers denied that they had made any overcharges, and they repudiated liability for any demurrage. They contended in the first place that the berth to which the vessel proceeded under the orders of the harbour master was not a loading berth and that the lay-time did not commence till the vessel arrived in the berth to which she subsequently proceeded under the charterers' orders. They further contended (and in this they were supported by a certificate issued by the Odessa Bourse Committee) that a number of Jewish holidays were not lay days. The Court of first instance decided that the lay days counted from arrival in the berth to which the vessel was ordered by the harbour-master, that the Jewish holidays were in fact lay days, and that the owners had been overcharged in respect of several items in the ship's accounts. The owners' claim was allowed at Rs. 3,100. Against that decision the charterers appealed. The owners defended the appeal by way of a cross-appeal. The Court of Appeal recently dismissed the charterers' appeal and increased the judgment in the owners' favour by Rs. 166·26. Dr. Antonini, who conducted the case on behalf of the owners, considers that the decision is of considerable importance to shipowners, as it establishes, among other things:—1. That the onus of proving that there are no overcharges in a ship's account is upon the person who rendered the account. 2. That the Jewish holidays are in fact lay-days, and that the Odessa Bourse Committee acted illegally in giving a certificate to the contrary.

The "Arabic."

The loss of the *Royal Edward* which was mentioned in these notes last week, was due to a legitimate act of warfare, and deeply as we regret the loss of life and the destruction of a fine vessel, we cannot but recognise the occurrence as part of the fortunes of war. The torpedoing of the *Arabic*, some sixty miles off the Irish Coast, is quite another matter and adds a further item to the account which one day will have to be settled. The news arrived at Lloyd's in the late afternoon, after many of the members had left for the day, but among those who remained deep feeling was expressed on all sides, not at the financial loss which the Room will suffer, but at the loss of the fine steamer and the wanton destruction of life. The *Arabic* was one of the best known steamers in the Transatlantic trade and was popular with Americans as a comfortable vessel on which to make a Mediterranean trip, for which purpose she was frequently used. Built in 1903 by Harland & Wolff, Ltd., her gross tonnage was 15,801, and she was insured against marine risks on a value of £190,100. Underwriters on the war risk policies will not suffer nearly as heavily as might be imagined, a large amount of the insurances being on bonds and securities, which, having no intrinsic value, are replaceable. It will be remembered that this was also the case with the loss of the *Lusitania*. Although last week was one of the heaviest for war losses since the beginning of the submarine "blockade," it does not appear to have affected the market to any extent, and underwriters are accepting their usual lines with freedom. Meanwhile the German Government finds itself hard pressed to explain away the murderous act. The German Wireless Press issued on Tuesday a series of excuses not one of which is likely to be accepted by any rational person. The statement seeks to show that the *Arabic* struck a mine, or that if it was torpedoed it deserved to be as it was carrying gold to pay for munitions, and in any event there was no catastrophy, as there was ample time to lower the boats. There are even alternative excuses to these.

Standard Merchant Ships.

According to a Transatlantic newspaper of some standing in the commercial world, "one of the things most needed in the creation of an American mercantile marine and in making possible the construction of American ships in American yards at prices which can compete with foreign yards, is a greater disposition toward standardisation." Shipowners must, we are told, restrict themselves to fewer sizes and kinds and shapes in order that there may be manufacture instead of building of ships. The phraseology is a little obscure, but the idea is tolerably clear. It is that if ships were manufactured in hundreds or thousands as, say, motor cars are, instead of in pairs or half-dozens, as is the case at present, the American shipbuilder could by reason of the extraordinary facilities for organisation which are available to him, beat the world in respect not only of delivery but also of prices. Moreover, with lower first costs—so, at any rate, the argument runs—an American mercantile marine would not take long to create. The prospect is, admittedly, alluring, and it need not be doubted that some interests will make the most of it. From the point of view of practical shipping there is, however, very little to be said for it. Ships vary in size and power and internal arrangement—not because shipowners wish them to vary, but because the conditions of their trades demand that they shall be so. The truth is that until the draught, warehouse accommodation, and cargo handling appliances of all the world's ports are standardised it is hopeless to dream of "manufacturing" ships on the American plan. A good deal more standardisation is possible in the construction of vessels, but for the reason we have given not much more can be done than is being done further to limit their sizes and kinds and shapes. Developments on the Great Lakes and in the American coastal trade admittedly suggest that the contrary is the case, but the great inland waters and seaboards of the United States are not the whole world, and it is in the larger world these enterprising people on the other side of the Atlantic aspire to shine.

An Historic Yard Closed.

By Royal decree dated July 4 last, the dockyard in Amsterdam for the construction of warships is closed. The national associations of this historic yard date back several centuries and have been intimately connected with the history of the Netherlands during this long period. As early as 1593 mention is to be found of it in Dutch chronicles, but the equipment of the yard was then too limited to meet the demands of the war of liberation fought against Spain. Numerous private yards had, therefore, to build warships, and it was not till after the Westphalian peace, in the middle of the 17th century, that the yard was extended to meet the full needs of the times. For some time the Amsterdam merchants flatly opposed the demands of the Princes of Orange for increased naval equipment, but an English warship which threatened the Dutch coasts in 1655 proved an effective argument, and work was begun and continued with such energy that Jost van den Vondel was moved to express (in verse) the opinion that the solid walls of the proud yard would outlast the world! The first warship built in the new yard was the *Harderwijk*, constructed in 1659 by the famous Jan van Reenen; the last to leave its slips was the small protected cruiser *Gruno*, in 1913. During the intervening 250 years about 850 warships were launched from this yard, the largest being the armoured vessel *The Seven Provinces*

in 1909. For some time it has been obvious that the yard could not deal satisfactorily with large modern warships and so it is closed for ever. It is said that Peter the Great spent much time in the yard, during his sojourn in Amsterdam and the neighbourhood, learning what was then known of the construction of warships. The great importance attached to the yard by Napoleon in his contemplated descent on England is shown by the negotiations between the Imperial Government and the engineer Jan Blanken in 1811, with a view to making the yard a base for French naval action against this country. Blanken's plans, which are to be seen among the archives of Amsterdam, were still *in embryo* when the events of 1813 arrested their development. Napoleon was compelled to leave the Netherlands, and in November of that year the Imperial eagle was removed from the entrance to the yard and the banner of Orange re-hoisted in its stead.

Shipbuilding Prospects.

The fear has been expressed that the present great activity in shipyards will cease at the end of hostilities, and a period of great depression in shipbuilding must ensue. Doubtless a large number of ships which are at present on special service will be released for their legitimate trade when peace is declared and many that have been employed for the transport of troops and munitions will then resume their regular services. There would thus appear to be less necessity for new tonnage after hostilities than at present. It must be remembered, however, that many of the vessels at present on transport work have been drastically altered to make them suitable for such. These will require to be refitted and made ready for their normal duties. Work on many important vessels at present under construction has meantime been suspended owing to more pressing work on hand and the cessation of hostilities will see a resumption on these. The remarks of the chairman of Messrs. John Brown & Co. at their annual meeting, when he said that they and the firms associated with them had on their books orders for from 300,000 to 400,000 tons of new shipping to be entered upon when occasion permits, indicate also a shipbuilding boom on merchant work of considerable proportions. Several important lines have under consideration the construction of new vessels, and the cessation of merchant ship construction which has been occasioned has delayed the placing of this work. Altogether the prospects are distinctly good, and not for some considerable time can there be any depression in the staple industry of this country.

Engines for Submarines.

Two of the three European Powers which have built submarines extensively originally adopted particular forms of the internal-combustion engine for surface propulsion and developed them to points of comparative perfection. The other was not so conservative with, however, no less satisfactory results. In the course of its experiments it tried a variety of designs, and out of the experience evolved a fairly satisfactory machine. America's naval authorities appear to think more of the latter method than they do of the former, for they are installing in their newer submarines examples of all the best-known types of Diesel engines—amongst them the Sulzer. The Sulzer, although an excellent two-cycle motor and well thought of by marine engineers, has not yet been extensively tried for any kind of marine work. It has, however, been tested, with very successful results. It is the engine of the Hamburg-South American Line's *Monte Penedo*—of which excellent accounts were heard before the outbreak of war—and it is in an American submarine which has, so far, performed satisfactorily under severe trial conditions imposed by the authorities at Washington. It is on the strength of this submarine's performances that Sulzers have been ordered for one or two of the new boats. It will be interesting to see which of the engines now, or shortly to be, on trial on the other side of the Atlantic has the most influence on the inevitable evolution. That one will wholly survive is unlikely, for submarine requirements are very exacting. Whether the evolution of a suitable engine out of a trial of several designs is a better method than the development of single form may be moot. In any case, however, the methods are to be judged by their results, and nothing has happened to date to show that the Americans have erred in their choice. Indeed, the opinion is largely held that if a greater number of oil engines had been seriously tried for submarine work here and in Germany the results might have been even better than they are.

Behaviour of Submarines.

Those who have observed an aeroplane in flight have no doubt noticed the rolling of the machine. This is very apparent in a gusty wind, and the same conditions obtain in a submarine running submerged, if the water on the surface is rough. A submarine rolls a slight amount at a depth of 50 ft. if the surface is very rough, but practically all motion is lost at a depth of 75 ft. During some manœuvres in the English Channel commanding officers of submarines reported that it was difficult to find a depth in which there was no motion. This can be readily understood, as the waters in that vicinity are somewhat shallow and the ground swells can be felt quite near the bottom. Depth is maintained by the use of horizontal rudders. The depressed rudder sends the stern up and the bow down, and as soon as the boat is inclined downwards the plane of the deck gives a large surface for the water to act upon and the power delivered to the propellers may be resolved into two components, namely, the horizontal which drives the boat ahead and the vertical which drives it downwards. The amount of the vertical component of the power delivered is controlled entirely by the horizontal rudders. The hull is so built that normally there is a tendency for the boat to rise, this being brought about by the angle of the hull and the unbalanced pressures caused by inequalities in the areas of the surfaces on the bottom of the boat, and also on top of it, and this tendency must be counteracted by the trimming of the vessel and the action of the horizontal rudders. This is one of the points dealt with by Lieutenant Hinkamp, of the United States Navy, in his paper "Submarines and Torpedoes," appearing in the "Journal of the American Society of Naval Engineers."

The Stokehold in War.

In the course of the paper entitled "Coal for the Navy" which was contributed by Lieutenant-Commander J. L. Richardson, of the United States Navy, to the "Journal of the American Society of Naval Engineers," attention is drawn to the needs for educating the firemen in the use of the particular class of fuel, and a warning is given against the practice of teaching them to use one kind of coal during peace time and another directly war breaks out. The existence of the Navy is justified only on the supposition that it will be kept at all times in the maximum state of readiness for war. Wars often come with little if any advance notice, and if the Navy is allowed to fall into a state of unpreparedness in any detail with the expectation of perfecting that detail when war is threatened it is inviting disaster. One of the most important of these details is the ability of the fleets to steam the greatest distance with the amount of coal they can carry and to develop the maximum speed when required. This ability depends in a large degree upon the skill of the stokehold force, and this skill can be assured only by careful instruction and training. It is essential that the firemen on board a man-of-war should be kept as well trained as the gun crews. To make them unlearn what they know now, and learn to handle a kind of coal which is to be used only in time of peace and then depend upon their relearning in time of threatened hostilities to burn to best advantage the kind of coal that must be used in time of war, would be analogous to requiring the gun crew to use brown powder at target practice and depend upon them to learn at the outbreak of war to use smokeless powder, the only suitable kind in battle.

DUTCH SHIPPING COMPANIES IN 1914.

As might be expected the latest annual reports of the leading Dutch shipping companies do not disclose exceptionally favourable results for the past year. Broadly, they constitute a tale of fairly normal development for seven months of the year, then a period of more or less complete paralysis, followed by a period of recovery during which high rates and heavy premiums have had to be set against high freights so that, on the whole, the effect of the war has been adverse. The Holland America Line alone shows an increase on the previous year's dividend, the advance being from 15 to 17 per cent. In the early days of the war the position of this company was naturally exceptionally favourable, but in the late autumn the flow of traffic to Rotterdam came practically to a standstill, and, since emigrant traffic was practically suspended, there began a period of depression which still exists so far as concerns inward traffic, though there has been a recovery in outward traffic. To meet the exceptional demands, the company increased its fleet by the purchase of 4 vessels and the chartering of 49 others; the only loss sustained is believed to be the damage to the *Noordam* by running on a mine in the North Sea. The working account shows £556,690 (£558,290 in 1913) profit, and the gross profit amounted to £604,484 (£580,986 in 1913).

Due to weakness in the freight market and keen competition between various lines, business was not satisfactory with the Koninklijke Nederlandsche Stoomboot Maats. during the first seven months of the financial year, and conditions were worse still when the outbreak of war threw the whole credit system out of joint and brought business to a standstill. After November, however, a limited and somewhat irregular service was restored, high freights being naturally obtained. The steamers *Achilles* and *Deucalion*, surprised by the entry of Turkey into the war, are interned at Smyrna. The Stoomvaart Maats. Nederland had similar experience at the beginning of the year, but in October exports from Java revived and became unusually heavy at the New Year. Much of the advantage from the high freights was only apparent, owing to the unprecedented cost of coal and the heavy insurance rates. Working profits amounted to £414,720 (£406,010 in 1913), and after allocating £213,420 (£167,540 in 1913) to depreciation on steamers, 7½ per cent. (10 per cent. in 1913) dividend was paid.

Conditions were very unfavourable to the Rotterdamsche Lloyd during the early days of the war, but, after the removal of restrictions imposed on exports from Java, the demand for ship space became urgent and bids exceeded all previous records. Freights, though raised to cover increased working costs, were kept within assigned limits, and circumstances did not permit the company to handle much of that business which would normally have been done by German lines. A working profit of £361,510 (£397,670 in 1913) was brought up to £369,854 (£409,406 in 1913) by interest, &c., and 7½ per cent. (10 per cent. in 1913) dividend was distributed.

Business in the Far East was so affected by the war that the Java-China-Japan Line found it impossible to increase freights sufficiently to cover the great increase in working costs, and the gross profit of £77,490 (£126,540 in 1913) yielded £30,322 (£41,003) net profit, from which 6 per cent. (8½ per cent.) dividend was paid. The aggregate capacity of the fleet amounts to 45,072 tons (37,014 tons in 1913), and its book value at the end of the financial year was shown as £401,206 (£301,420).

The fleet of the Koninklijke Paketvaart Maatschappij consisted, on June 30 last, of 90 vessels and 5 under construction. During the first half of the year development was normal, but the outbreak of war brought things to a standstill and the gross receipts for the last five months scarcely reached the figures for 1913. The service to Australia was not discontinued, but, owing to the conditions prevailing, only five voyages were made in the Siam service and these yielded neither profit nor loss. The gross profit amounted to £255,726 (£310,200 in 1913), depreciation on the fleet was charged as £163,430 (£115,490), and the directors declared 5 per cent. (9 per cent.) dividend on a share capital of £1,583,300 (£1,333,300). To the end of the year the first cost of the fleet amounted to £3,614,000 (£2,561,850), the book value being written down to £2,109,900 (£1,951,600).

The new Rhine Shipping Company has suffered considerably by the war, receipts amounting to £226,095 (£285,846), including £15,617 (£17,022) dividends from the Koninklijke West Indische Maildienst. Altogether the net profits amounted to £132,800 (£206,220), from which 6 per cent. (8 per cent.) dividend was paid, and, at the end of the financial year, the fleet comprised 50 ships, totalling 131,770 tons burden.

During 1914 the Nederlandsche Scheepvaart Unie issued ordinary shares to the value of £500,000 and was thus able to take over £250,000 worth of shares from the "Nederland" Company and a like amount from the Koninklijke Paketvaart Maatschappij. The balance sheet, made up to December 31 last, shows ordinary shares to the value of £2,450,250. Dividends from various holdings were as follows: £67,506 (*i.e.*, 7½ per cent.) on £900,000 in the Nederland Company; £48,756 (*i.e.*, 7½ per cent.) on £650,000 in the Rotterdamsche Lloyd; and £45,000 (*i.e.*, 5 per cent.) on £900,000 in the Koninklijke Paketvaart Maatschappij, making £161,270 total. In addition, the Unie received from these three companies the statutory contribution of £12,500. From a net profit of £174,900 (£201,496 in 1913) the directors recommended payment of the usual 4 per cent. on preference shares and 7·1 per cent. on ordinary shares, as compared with 10·3 per cent. for the previous year.

LABOUR AND WAR MUNITIONS.

CONSIDERING that the basis of the Munitions Act is a memorandum of agreement approved by a majority of the members of the Amalgamated Society of Engineers, the disinclination of many of the rank and file to allow the legislation to have its due legal effect is odd. A majority of the men are agreeable, if votes mean anything, to suspend all rules and practices having a restrictive effect on output; yet in most of the important industrial areas there is an undercurrent of opposition with large possibilities of danger in it, and in the high places of the Society men are to be found with so little courage as to seem to stand somewhat in awe of it. The opposition cannot be large, or it would have managed to express itself in the ballot. Yet it is effective enough to make trouble, and it is apparently largely composed of men whose vocal power is greater than their voting power. They are strong enough, at any rate, in the branches and in the workshops to make both new and old candidates for executive office extremely careful of the going—so to say.

There is abundant proof of that in the addresses of the present aspirants to executive rank and also in those of the men who are seeking re-election. The majority of the old hands in a way apologise for the existence of the Shells and Fuses Agreement, the Treasury Agreement, and the Munitions Act. The best that any of them can think of saying for either set of provisions is that it is not so bad as, but for their heroic exertions, it might have been. Considering that all three have nominally the approval of the men—the success of the Munitions Volunteer scheme is not a bad test of the feeling about the Act—the apologies are a sort of gratuitous impertinence. But then the strenuous minorities of Trade Unionism are always gratuitously impertinent. One or two of the old hands at Peckham Road do not, however, even apologise. Take, for example, Mr. Goman, the Scottish representative, who in a dreadfully involved paragraph, declares that the Government and not the trade unions were responsible for the shortage of shells.

The Government should, he says, have spread the manufacture of shells over a wider area, and not confined it to a few employers

who could not carry out their contracts. What good spreading the work would have achieved is not very clear seeing that the root trouble was a shortage of men —which could not be made up except by the relaxation of certain trade union rules affecting the employment of semi-skilled and unskilled men and women. The truth appears to be that some so-called leaders of the men are prepared to say anything on this subject which is calculated to please the minority of members who make the pace in the branches. They are prepared even to defend the forceful few from charges which they do not take the trouble themselves to rebut.

"Take," says Mr. Goman, "the White Paper issued by the Chancellor, which will stand as a reproach and disgrace to the Liberal Government, whose only desire was to save the employer and blame men who were giving of their best." The quoted words are, of course, simply nonsense. The White Paper was exactly what it professed to be—a summarised record of the time worked in stated periods by a number of men. For the extensive broken time which the figures disclosed excessive drinking was said to be to blame, but whether it was or was not left unaffected the fact that the men whose times were enumerated were certainly not "giving of their best." The effect of championship of this character can only be, we regret to say, to encourage workmen to snap their fingers at the Munitions Act and otherwise impede the desirable improvement in the output of shells and guns.

To call Mr. Proctor, of Devonport, a new candidate for office would be to say something which was not strictly true. Mr. Proctor has been an aspirant to office on many occasions without success. He again offers himself for election to the executive council, and naturally—being an aspirant and not actually in office—he panders to the views of the pushful few. He alleges, for instance, that the war has brought about "a set of economic circumstances which the enemies of Trade Unionism are taking very cunning advantage of." As nobody is regarded as an enemy of Trade Unionism except employers, it is easy to see what Mr. Proctor is driving at. His contention is, however, ridiculous, for all the employers who are affected by the new economic circumstances are under the control of the Ministry of Munitions.

"While," the candidate proceeds to observe, "the employers will be able to increase their profits in excess of the profits of the past two years, we shall not be allowed to enforce an increase of wages though the purchasing power may be considerably decreased by higher prices." Neither of these statements is true. The profits of the owners of controlled establishments are definitely limited, and the men are as free to apply for advances as ever they were. Mr. Proctor ignores the fact that not every demand of the men for increase of wages is "enforced." Nor is there any foundation for this statement:—"The Minister of Munitions and the capitalist employers have promised (*sic*) that the conditions before the war shall be reverted to when the war is over; but what value, fellow-members, is such a promise? Why have our leaders not insisted on a very definite clause in the Act rather than a flimsy promise which, and no doubt will, be broken under various excuses, even if the promise is kept for a time?" The guarantee to restore pre-war conditions is as a matter of fact Statutory.

"The mass of unskilled workers who are being trained during the war will be used," Mr. Proctor says, "against us in the first industrial struggle that is forced upon us when trade is at a low ebb." Not only would it be illegal of employers to do anything of the kind, it would also be a breach of the Shells and Fuses Agreement. This candidate, it is true, does not think highly of employers' promises. All the same, not long ago the Committee on Production was told by a highly placed official of the Amalgamated Society of Engineers that the Engineering Employers' Federation always kept its agreements. And, as a matter of fact, it does.

With officials and would-be officials writing as these two do, is it any wonder that the Munitions Act is much less effective than it might be? Frankly, we do not think that it is.

THE EFFECTS OF HEAT AND WORK ON METALS.

IN the early part of the present year Prof. A. K. Huntington read a most important paper on "The Effects of Heat and of Work on the Mechanical Properties of Metals," and this paper is reproduced in Vol. XIII of the "Journal of the Institute of Metals." More recently the paper was discussed, and a number of written communications read. One of the most interesting communications was that of Dr. George K. Burgess, of the Bureau of Standards, Washington. In his communication, Dr. Burgess remarked that the author of the paper was to be congratulated for emphasising the need of increasing the meagre knowledge of the behaviour of metals in two very important respects, namely, (1) the change of physical properties over considerable temperature intervals, and (2) the determination of the effects of alternating stresses. Both of these matters are of exceeding importance to those engaged in the shipbuilding industry. The experiments of Prof. Huntington in combining these two phenomena for copper and copper alloy afford a welcome addition to this difficult and too little explored field, and it is to be hoped that he will be able more definitely to delimit the periodicities in properties and to extend his investigations to other metals.

Prof. Huntington laid great emphasis, and rightly so, on the importance of mechanical tests over long ranges of temperature as being helpful in clearing up and defining the nature of the changes in state which occur in metals. Dr. Burgess found it difficult to follow the author of the paper in his reference to heating and cooling curves as a relatively unsatisfactory method of attack because of "the fact that the changed points in a metal cooling after solidification appeared to be largely potential rather than actual and consequently very little heat is absorbed," whereas "when work is put on a metal the change points are developed in a surprising manner." Now almost any physical property available, with the possible exception of alternating stress phenomena, might be examined with continuously changing temperature, and if the measurements were made with sufficient precision and slowness the change points or ranges would be brought out if they affected the phenomenon in question. Thus, for example, the electrical resistance of a metal such as iron or copper might readily be measured continuously and at a very slow and uniform rate over a wide temperature intervals, say, 0 to 900° C. to one part in 300,000, an accuracy far greater than that which could be ordinarily attained in the mechanical measurements. Similarly, despite the statement of Osmond quoted by Prof. Huntington, the accuracy of thermo-electrically measured cooling curves might be practically of any desired precision, and as has been shown by another investigator the very considerable delicacy that might readily be obtained in dilletation measurements using solid steel.

In view of the author's interesting results showing certain apparent mechanical periodicities for copper and copper alloys, although it was not always easy to follow his construction of the curves as drawn with their peaks not always apparently defined by the observations, it would be interesting to take a heating curve by several of the above-mentioned extremely sensitive methods for copper initially in a state of severe internal stress to see if this periodicity was still present for these other physical properties.

Undoubtedly the whole question of these anomalies in properties of the ordinary metals, particularly as associated with real or supposed allotropic changes of the first, second or third order of intensity or extent, is one that requires a great deal more experimental work before the many questions of type and theory which have been recently raised can be settled satisfactorily.

LETTERS TO THE EDITOR.

DEADWEIGHT DISPLACEMENT RATIO.

53, Bothwell Street, Glasgow,
August 20.

To the Editor of Shipbuilding and Shipping Record.

Mr. Simpson's letter on this subject is very interesting, and touches on a important point. But it is only one out of a number of points that are closely connected with each other.

It is another of these points I would mention. Lloyd's requirements constitute an excellent standard, and anyone following their rules cannot go far wrong. That is the object for which such rules are produced. But they need not be slavishly followed, and there are some shipowners who deliberately put more weight into the structure of their vessels than the rules demand. They are quite willing to pay the extra first cost, and content also that the ratio of deadweight to displacement should thereby be affected. Such shipowners do not act from want of knowledge, or from indifference to profit earning. They look at all the points in the problem and endeavour to make the best compromise.

One case of a tramp steamer occurs to me, where I think the owners were convinced that it would have been better had the rules been exceeded in certain directions.

The design for each ship must be considered in relation to her particular service, and it must not be forgotten that the largest possible carrying capacity does not in every case make the most profitable vessel.

J. E. BARNETT.

Newcastle-on-Tyne,
August 23.

To the Editor of Shipbuilding and Shipping Record.

In your issue of August 12, Mr. Maxwell Ballard has honoured me by entire disagreement with the views expressed in my letter on the above subject. I cannot go into his "Arch" principle here, nor into all the points he raises, but I should like to deal with some of these latter. The "three-island" type was taken by me as an instance. The "well-deck" or the "awning-deck" type would have served the purpose as well, or even the "Arch" type, only that in the case of the latter it would have had to be explained that the sheer has here been levelled up. Parts of erections above the ordinary sheer line will not, of course, make for wetness. A wave of ship's length, in passing along a vessel, rises higher at her tapered ends than at her mid-length. Further, as the ship runs into the waves forward and out of them aft, the extra height is greater forward than aft. The sheer of a ship takes this into account, and scientific people will do well not to ignore it. In regard to the calculation of the longitudinal bending moment, very little progress can be expected until we know the relation borne by the height of a full-grown ocean wave to its length. The assumption underlying the ordinary calculation, that "wave length = 20 times wave height" is a makeshift. In some quarters "wave height" has been assumed to be equal to $\frac{1}{c}$ wave length, by a constant, and this may be correct, but its correctness has not yet been sufficiently demonstrated or generally accepted. In proper hands, the ordinary longitudinal strength calculation has its uses, but it cannot in its present form be made the basis for the fixing of scantlings.

ARTHUR R. LIDDELL.

The "Anglo" for Coal Service.—Owing to increasing demand for coal at the Panama Canal zone, the ss. *Arcos*, of the Panama Railroad Steamship Line, will enter the coal service as auxiliary to the Canal colliers *Achilles* and *Ulysses*.

GOVERNMENT CONCESSIONS TO MERCANTILE OFFICERS.

The Imperial Merchant Service Guild have been in communication with the Admiralty and the Board of Trade regarding the services of officers employed on board ships under Admiralty charter, officers of the Royal Naval Reserve, and officers holding Board of Trade certificates, serving in the army. The following temporary modifications in the regulations have now been issued concerning this matter which hitherto, as the Guild pointed out, involved considerable hardship:—

Service under the Admiralty.—All service afloat during the war in His Majesty's ships or in auxiliary supply ships or any other ships in attendance on the fleet will be accepted in full (subject to the ordinary conditions as laid down in the Board's regulations) as qualifying sea service for the purposes of the Board's examinations of masters, mates and engineers.

The Board cannot undertake to accept the whole or any definite proportion of service in the Royal Naval Reserve, which is not qualifying service in accordance with the regulations, but they will be prepared to consider sympathetically an application for examination from a candidate who has been prevented by his service in the Royal Naval Reserve from complying fully with the Board's requirements. This may be taken as applying, *e.g.*, to service with a first or second mate's certificate, but in a rank below that of acting sub lieutenant, and to service in the engine room during which a candidate for a first-class certificate was not the senior engineer in charge of the whole watch on the main engines or boilers.

Service in the Royal Naval Reserve: Antedating Certificates.—The Board of Trade have been in communication with the Admiralty with regard to the case of men serving in the Royal Naval Reserve during the war who are prevented by the exigencies of the service from presenting themselves for examination on completion of the period of qualifying service required by the Board's regulations. Arrangements have been made whereby, if such a person passes the examination for a certificate of competency at a time not remote from the conclusion of hostilities, he may have his certificate antedated.

Service in the Army.—The Board are anxious that, so far as it is reasonably possible, seamen or apprentices who are at the present time serving in the army should not be hindered in their ordinary profession; but the Board cannot, in the absence of any indication of the probable duration of the war, give a definite undertaking with regard to the extent to which such service could be accepted as part of the service required to qualify for certificates of competency in the mercantile marine. The Board must have regard to the essential condition that their certificates must testify to actual competency, but they will be prepared in due course to consider sympathetically any application to be examined by a candidate who has been prevented from complying fully with the regulations owing to his service in the army.

This may be taken as applying to candidates for engineers' certificates who were prevented, by serving with His Majesty's forces, from completing, before January 1, 1915, the 12 months' sea service required by the regulations then in force.

Service under an Auxiliary First Mate.—With reference to paragraph 38 (*c*) of the regulations relating to the examination of masters and mates, the Board have decided to accept service as second mate while holding a first mate's foreign-going certificate and performed during the war under an additional or auxiliary first mate as qualifying service for a master's certificate, provided that a third mate is also carried and the requirement that there shall be a fourth mate will, for the time being, not be insisted upon.

First-Aid Certificates.—A first-aid certificate which, though otherwise valid, is more than three years old, will be accepted during the war if the holder has been prevented from renewing it by reason of the exigencies of the war service.

TRIAL DATA OF U.S.S. "BALCH."

The torpedo-boat destroyer *Balch*, belonging to the United States Navy, was the subject of a communication to the Journal of the American Society of Naval Architects recently by Mr. Henderson B. Gregory. In giving particulars of the contract trials of this the author states that the *Balch* is one of eight destroyers authorised by an Act of Congress, approved March 4, 1911. She is a sister ship of the *Aylwin*, *Parker* and *Benham*, the four vessels being built under contract by the William Cramp & Sons Ship & Engine Building Company, of Philadelphia, Pa., at a price of £151,220 each. The time of completion for the *Balch* was 24 months from the date of signing the contract, September 7, 1911. She was designed for a speed of 29·5 knots, at about 1,036 tons displacement, with the main engines developing 16,000 s.h.p.

The *Balch* is a twin-screw vessel fitted with a combination of Cramp-Zoelly turbines and reciprocating engines, one of each on each shaft. For speeds of 17 knots and above the turbines alone are used, and for the lower cruising speeds the reciprocating engines are used in combination with the turbines, disconnecting couplings being installed for readily throwing the latter in and out of gear. Steam is supplied by four oil-burning White-Forster water tube boilers, arranged in pairs in two separate compartments. The hull and machinery are duplicates of the *Aylwin*, *Parker* and *Benham*, described in the February, 1914, number of the Journal of the American Society of Naval Engineers.

The following hull and machinery data are given by the author:—

Length on l.w.l. ... ... 300 ft.
,, over all ... ... 305 ft. 3 in.
Breadth at l.w.l. ... ... 30 ft. 4 in.
Ratio, breadth to length (l.w.l.) ... ... 10·064.
Draught to l.w.l. ... ... 9 ft. 2⅜ in.
Displacement corresponding ... ... 1,010 tons.
,, per inch at l.w.l. ... ... 14·21 tons.
Area immersed midship section ... ... 190 sq. ft.
Coefficient of fineness, block ... ... 0·415.

Main turbines:—
Working pressure at chest, gauge ... 240 lb.
R.P.M., designed ... ... 620.
S.H.P., ,, ... 16,000.
Number of stages, ahead ... ... 16.
,, ,, astern ... ... 8.

Cruising engine:—
Type ... ... Vertical, inverted, direct acting, compound, jacketed.
Cylinder, h.p., diameter ... ... 13 in.
,, l.p. ,, ... 25 in.
Stroke ... ... 12 in.
Crank, angle, degrees 180
R.P.M. (corresponding to a speed between 15½ and 16 knots) 300.
I.H.P. (corresponding to a speed between 15½ and 16 knots) 460.

Boilers:—
Type ... ... White-Forster, oil-burning, water tube.
Working pressure ... ... 260 lb.
Number ... ... 4.
Furnace volume, each ... ... 452 cubic ft.
Number of smoke stacks ... ... 1.
Area through each smoke pipe ... ... 16·57 sq. ft.
Area through smoke pipe / Furnace volume ... ... 0·03666.
Heating surface, each ... ... 5,400 sq. ft.
Heating surface / Furnace volume ... ... 11·9.
Oil burners, number each boiler ... ... 11.
,, type ... ... Schutte-Koerting.

The contractors guaranteed that the fuel-oil consumption per knot run for all purposes, including that necessary for all auxiliaries in use on the trials, would not exceed 705 lb. at the guaranteed maximum speed of 29·5 knots, 445 lb. at 24 knots, 213 lb. at 15½ knots, and 170 lb. at 12 knots.

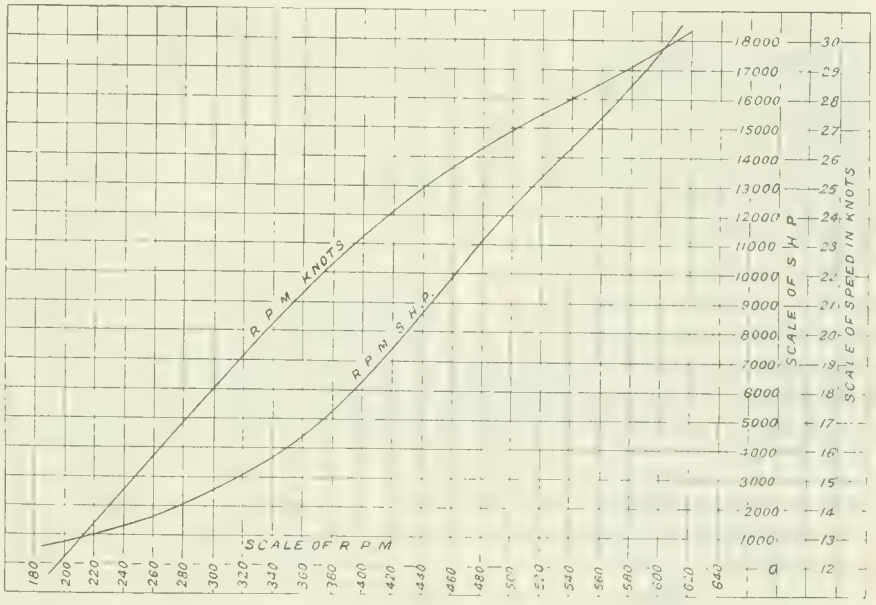
The standardisation trial was run on the measured mile course off Delaware breakwater. It was commenced at 2 p.m., on February 21, 1914, and temporarily discontinued at 5.35 p.m., on account of darkness, 18 runs having been made. The trial was resumed at 7 a.m. the following day, and was completed at 9 a.m., 12 additional runs being made, Nos. 19 to 30 inclusive. The conditions of weather and sea were favourable throughout the runs. The data obtained, at the several speeds, is embodied in the accompanying diagram. It was deduced from the official revolution speed curve that the following mean revolutions per minute of the two shafts, are required to obtain the speeds noted:—

R.p.m.	Knots.
196·9	12
256·7	15·5
417·7	24
593·3	29·5

It was estimated that the displacement at the middle of the five high runs was 1,049 tons, corresponding to a mean draught of 9 ft. 6⅛ in.

U.S.S. "BALCH."—PROGRESSIVE TRIAL RESULTS.

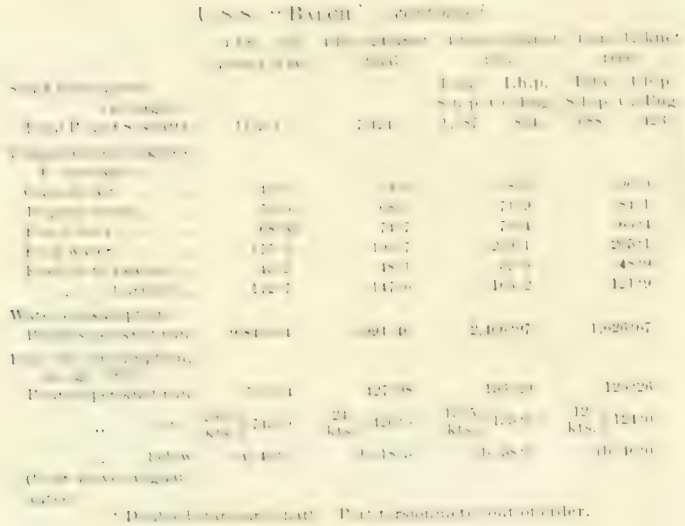
	4 hrs. full-power trial.	4 hrs. 24 knot trial.	4 hrs. 15½-knot trial.	4 hrs. 12-knot trial.
Speed (knots)	26·618	24·031	15·594	12·206
Draught, mean... ...	9′ 4⅛″	9′ 6⅜″	9′ 5⅜″	9′ 7⅛″
Displacement, corresponding (tons)	1,023·9	1,053	1,050	1,065·5
S.h.p. of propellers (per cent. mean)	24·605	13·67	8·25	7·355



U.S.S. "Balch" Standardisation Trial Curves.

Engines in operation ...	Main turbines	Main turbines	Main and cruising	Main and cruising
No. of boilers used ...	4	4	2	2
No. of burners used (11 per boiler) (average)	41·5	21⅝	5	3⅜
Heating surface used (sq. ft.)	21,600	21,600	10,800	10,800
Heating surface used (sq. ft. per s.h.p.)	1·2521	2·9095	6·8815	15·697
Cooling surface (sq. ft. main condenser per s.h.p.)	0·6957	1·6166	7·5626	17·447
Pressures average	Stbd. Port.	Stbd. Port.	Stbd. Port.	Stbd. Port.
Main steam at boilers (lb. gauge)	249	248·1	245	242·2
Main steam at engine room (lb. gauge)	246·8 249·1	245·4 247·0	244·4 246·6	245·6 246·4
Full speed ahead, chest (lb. absolute)	215·0 215·0	84·4 87·9	21·6 15·0	14·1 13·6
Medium speed ahead, chest (lb. absolute)	192·4 202·6	212·5 213·8	35·6 29·4	25·3 23·5
Vacuum main condenser (in. mercury)	28·90 29·03	29·00 29·30	28·84 29·60	29·00 29·80
Fuel oil (lb. gauge) ...	211·1	207·5	180·0	214·4
Air pressure in stokeholds (in. of water)	7·27	4·23	2·15	1·3
Revs. or double strokes per min. (mean)	597·06	418·63	258·31	200·29

U.S.S. "Balch"



PANAMA CANAL SHIPPING FACILITIES.

The official handbook of the Panama Canal, issued recently, in addition to providing data concerning tolls and traffic routes, contains an admirable synopsis—albeit couched in most optimistic strain—of the shipping facilities in connection with that waterway. It is pointed out that the facilities are now ample for the present traffic, except for the lack of a large dry dock. The concrete is now being placed for the permanent dry dock at Balboa, which will accommodate the largest vessels afloat, and is to be finished by the end of 1915.

Extensive fuel-oil handling plants, with which are connected tanks belonging to individuals and companies, as well as those erected by the Government, have been established at both terminals of the Canal. Oil can be supplied to ships at the rate of 1,200 barrels per hour to each vessel.

The permanent coaling plants, now under construction at both terminals, will each be able to load coal into bunkers of vessels at the rate of 2,000 tons per hour. The plant at the Atlantic entrance is to have a storage capacity of little over 400,000 tons, and that at the Pacific entrance will have a capacity of 200,000 tons. Both will be equipped with unloading and loading cranes. These plants are to be completed early in 1916. The present means of supplying coal to vessels are from lighters at the Pacific entrance, and from lighters, or from cars alongside the wharves, or by cantilever crane at the coal wharf at the Atlantic entrance.

Water is supplied from the mains on the terminal wharves and piers. The water in Gatun Lake is fresh, but is not safe for drinking purposes in an untreated state. The water sold at the docks is drawn from the regular water supply systems and has been purified.

As the Panama Canal and the Panama Railroad Company are together operating a large number of vessels of a variety of classes, from tugs to ocean-going passenger and freight vessels, supplies for practically any kind of vessel are kept on hand on the Isthmus. Such supplies are for sale to all ships using the Canal, or calling at the terminal ports. The storehouses at Cristobal and Balboa have in stock all standard lubricants, light and heavy hardware, cordage, and miscellaneous ship-chandlery supplies. Food-stuffs and the general variety of merchandise handled by the commissariat department of the Panama Canal may be purchased for ships. The fact that the supply department is supplying regularly most of the food and wearing apparel of approximately 50,000 people is a guarantee that its operations are on a scale which can easily include the needs of ships now coming to the Canal. Prices are generally lower than the retail prices in the United States, or possibly about 10 per cent. higher than the wholesale prices there, and are said to compare favourably with prices in other ports of the world.

Laundry is handled quickly. No advance notice is required, and ship's laundry can be returned on the same day it is received. A vessel entering the Canal can forward its laundry by rail to the plant at Cristobal or the one at Ancon and receive it back by the time it is ready to clear from the other end of the Canal. Passengers' laundry can be handled with corresponding dispatch, but it is preferred to have at least two days for the work.

Except for the limitations imposed at present by the absence of a large dry dock, and of lathes for turning the largest crank-shafts and longest line shafts of modern vessels, the Canal shops can do practically any repair work which a vessel might bring. Sufficient materials, including heavy billets and all sizes of plates and angles, are kept on hand to meet every probable need. The foundry can make steel castings up to 5 tons in weight, and iron castings up to 10 tons, as well as brass castings of any ordinary size.

The shops at Balboa are equipped with a 540-ton hydraulic forging press, an open-side extension planer with capacity to plane 132 in. wide, 96 in. high, and 24 ft. long, lathes large enough for ordinary line-shaft work, and the usual accessories of fully equipped machine, boiler, and ship-fitters' shops. The shops alongside the dry dock at Mount Hope can do small machine work of moderate size, and practically any plate work likely to be required. By submitting to the delay necessary to transport parts to Balboa, all the facilities of the Balboa shops are also available for work at Mount Hope. The Mount Hope Dry Dock can take ships drawing 13½ ft. of water and 300 ft. long; the permanent dry dock now under construction at Balboa will take any vessel that can pass through the Canal.

The Balboa shops contain a plant for the generation of oxygen and acetylene, and both they and the shops at Mount Hope are equipped with tools for all kinds of cutting and welding. Compressed air, steam, water, oil, and electric current are available at the repair wharves in the maximum quantity required. Locomotive and wrecking cranes are available at the wharf side for lifting, and a derrick barge with a lifting capacity of 40 tons may be brought into service if necessary. Two floating derricks of 250-tons capacity have been erected and are practically ready for service.

Contracts for doing repair work at a stated cost can not be made by the Panama Canal, though estimates of probable cost can be furnished from the shops. Charges are made on the basis of actual cost of repairs, plus a percentage to cover overhead expenses, prescribed by the Panama Canal.

The Hotel Washington at Colon and the Hotel Tivoli at Ancon, adjoining Balboa, and the Hotel Aspinwall, on Taboga Island, are owned and operated by the Government for the accommodation of the travelling public. Rooms can be booked in the same way as at privately-owned hotels.

Ancon Hospital is equipped with 800 beds. It treats about 35,000 cases a year, in which approximately 7,000 surgical operations are performed. Its staff of physicians and surgeons includes men of marked experience and ability and several experts in tropical medicine. The treatment of cases from neighbouring countries and from ships is a part of its regular work.

Direct cable connections extend from the Isthmus to New York and to the west coast of Mexico, Central and South America. The wireless stations at Colon and Balboa handle commercial business.

Steamship captains or agents desiring the services of the Panama Canal in the way of supplies, repairs, &c., should communicate with the Captain of the Port at Balboa or Cristobal. Ships may communicate their wants by wireless in advance of arrival.

The Captain of the Port will furnish information in regard to placing orders, and should be notified of all orders placed, so that he may be able to keep track of them in relation to clearing ship, &c.

Bills for all supplies will be submitted through the offices of the deputy collectors at the ports for collection, or cash may be sent with orders. Bills for supplies furnished ships of regularly established lines will be submitted to the local agents, if desired.

COAL AND BUNKERING AT THE CANARY ISLANDS.

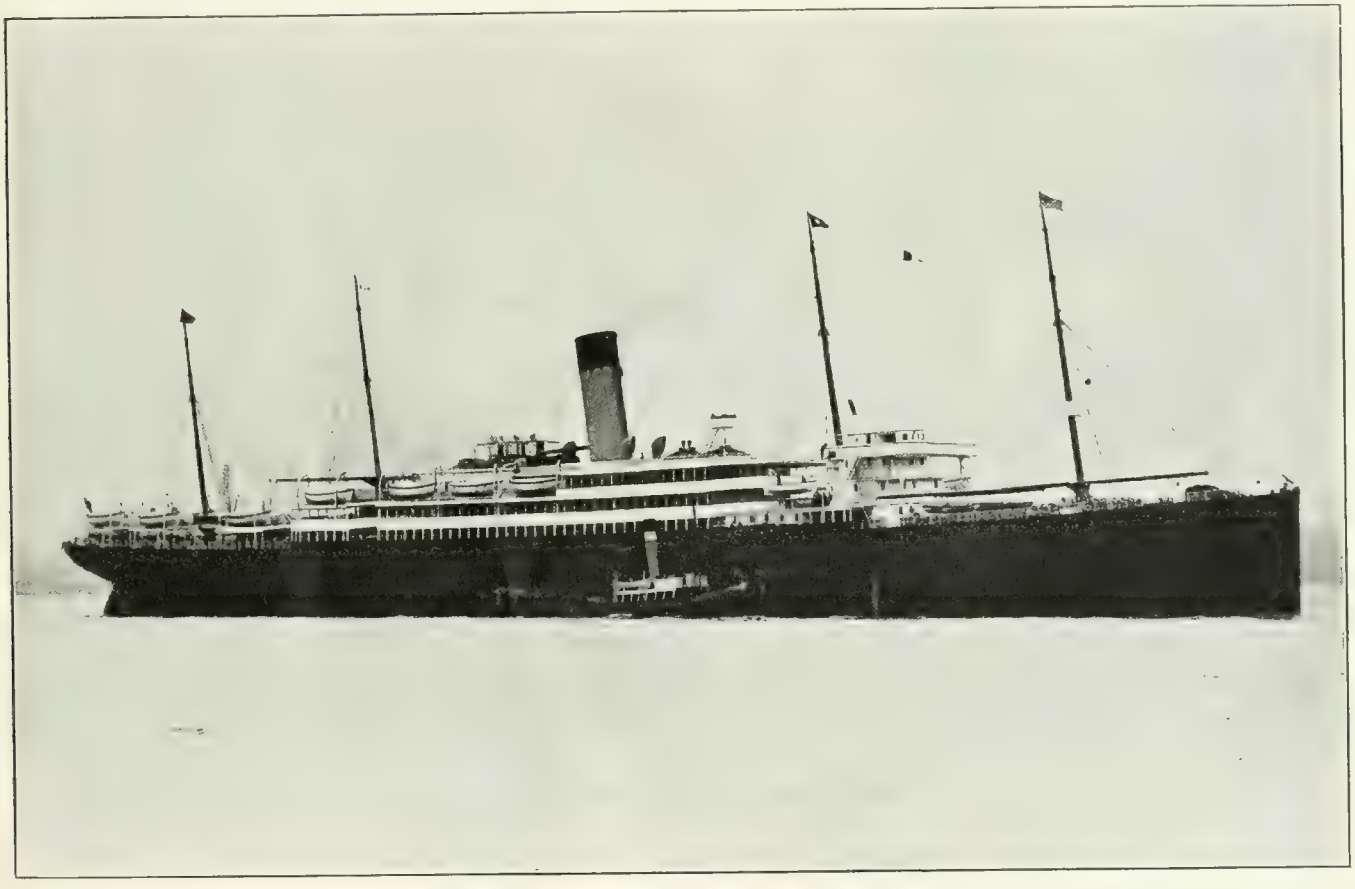
In commenting upon the trade conditions of the Canary Islands during 1914, His Majesty's Consul, Mr. Croker, states that the coal, practically all British, supplied to steamers at Teneriffe and Las Palmas for bunkering purposes during the past five years has been as follows:—

	Tons.
1910	1,052,643
1911	1,073,000
1912	1,347,036
1913	1,160,000
1914	706,565*
Of which to—	
Teneriffe	227,711
Las Palmas	478,854

* About 422,577 tons of Welsh and about 283,988 tons of Durham.

The British coaling depôts supplied 636,478 tons of the total quantity, the balance, 70,087 tons, all British coal, being the share of the business handled by the German depôts at Teneriffe and Las Palmas. The latter was supplied almost exclusively to German ships. In last year's report reference was made to the enormous bunkering business which had been attracted to the islands by the low prices brought about by the keen competition amongst the coaling depôts, and the hope was expressed that although reasonable prices had been reverted to, a large portion, at any rate, of the new business would remain. It may fairly be stated that up to the time of the outbreak of war this hope was realised; for the supplies for the first six months of 1914 amounted to 493,769 tons, whilst in the year 1909 (the year before the competition above referred to) the total for the 12 months was only 484,000 tons. The outbreak of war, however, paralysed the business temporarily, and supplies to steamers dropped upwards of 50 per cent. Apart from the reduced demand caused by the sudden disappearance from the seas of the German mercantile marine, the island suffered particularly from the dislocation of trade, owing to the fact that British shipowners found it more convenient to vary their usual routes, and many steamers which would under ordinary circumstances have called at the Canaries for supplies, filled up their bunkers in the United Kingdom, South America, or other starting ports, and gave the islands a wide berth. Normal conditions are, however, being gradually restored, now that the seas are almost free from enemy armed ships.

The state of the coal and freight markets in the United Kingdom is such that no regular fixed prices at the islands can be arranged, and all contract business is for the present suspended.



White Star Liner "Arabic," torpedoed by German Submarine.

The twin-screw steamer *Arabic* was built by Harland & Wolff, Ltd., in 1903. She was about 15,800 tons gross, had a speed of 16½ knots and had quadruple-expansion engines of about 10,000 i.h.p. Eighteen passengers and 24 of the crew are believed to have been lost, making a total of 39.

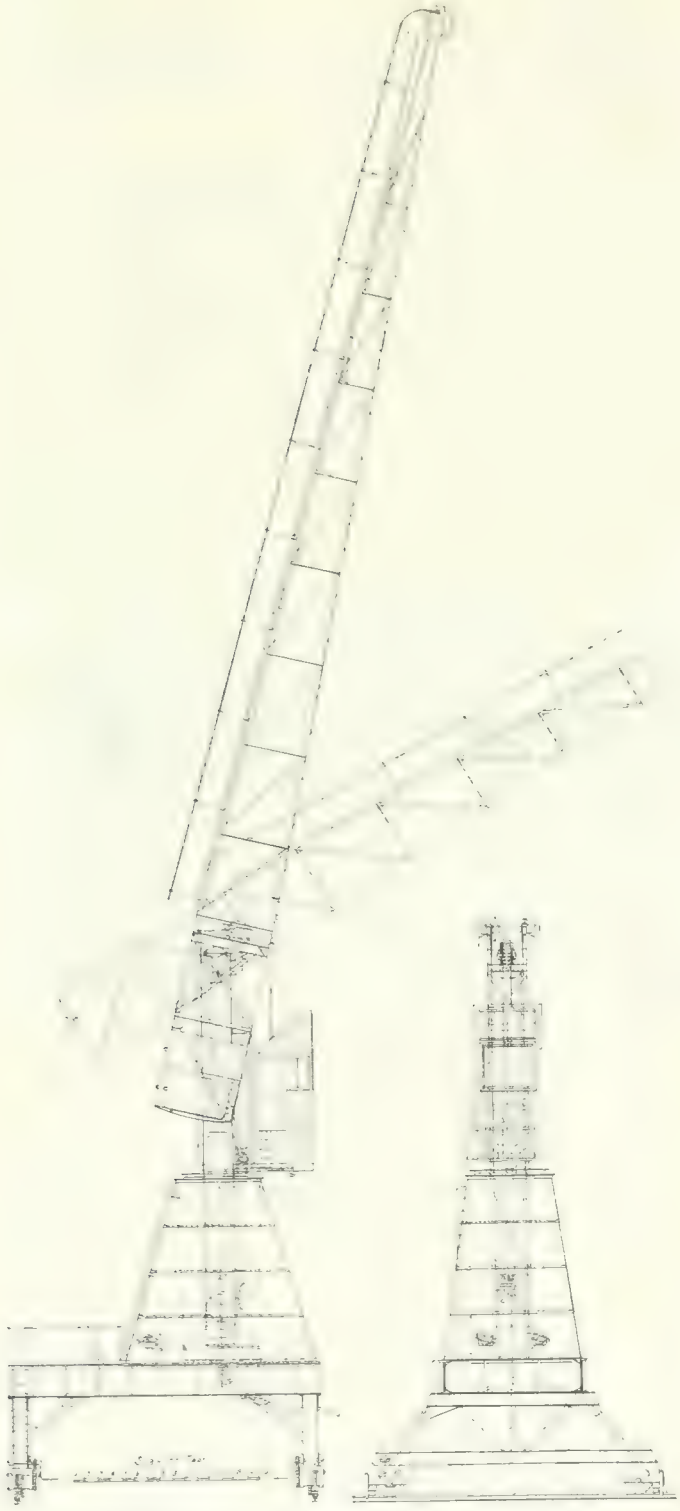
For some time after the commencement of the war the depôt proprietors continued to supply their regular customers at contract prices until their stocks became exhausted, since when prices have ruled as follows:—

	Price per Ton.	
	Welsh.	Durham.
	£ s. d.	£ s. d.
November, 1914	1 13 0	1 9 6
December, 1914	1 15 0	1 11 6
January, 1915	1 18 0	1 14 6
February, 1915	2 10 0	2 6 6

Towards the close of 1914 two Norwegian steamers arrived at Santa Cruz unconsigned, with cargoes of Pocahontas coal. After lying in port for some time these cargoes were discharged and the greater portion purchased by the British depôts.

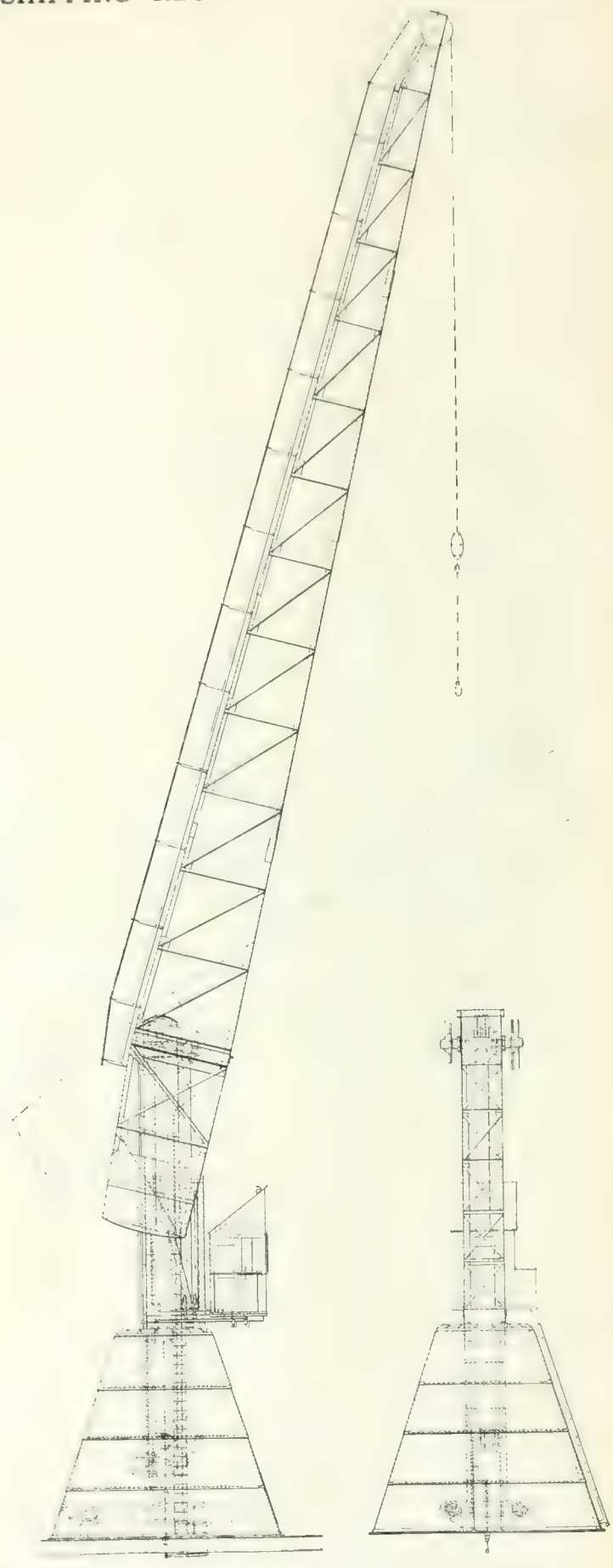
HYDRAULIC LUFFING JIB CRANES FOR THAMES WHARVES.

Builders: East Ferry Road Engineering Works, Co., Ltd., Millwall, London, E.



General Arrangement of Hydraulic (Musker & Davison's Patent) Luffing Crane for Middleton's Wharf.

Maximum rake, 65 ft. Minimum rake, 25 ft.
Load, 30 cwt.
Slew, 1½ turns. Lift, 65 ft. Working pressure, 700 lb.



General Arrangement of Hydraulic Luffing (Musker & Davison's Patent) Crane Pedestal Type.

Maximum rake, 75 ft. Minimum rake, 25 ft.
Loads, 25 cwt. at 75 ft. and 50 cwt. from 45 ft. to 25 ft.
Lift, 112 ft. Slew, 1½ turns. Working pressure, 700 lb.

DOCK & HARBOUR EQUIPMENT.

LUFFING CRANES ON THE THAMES.

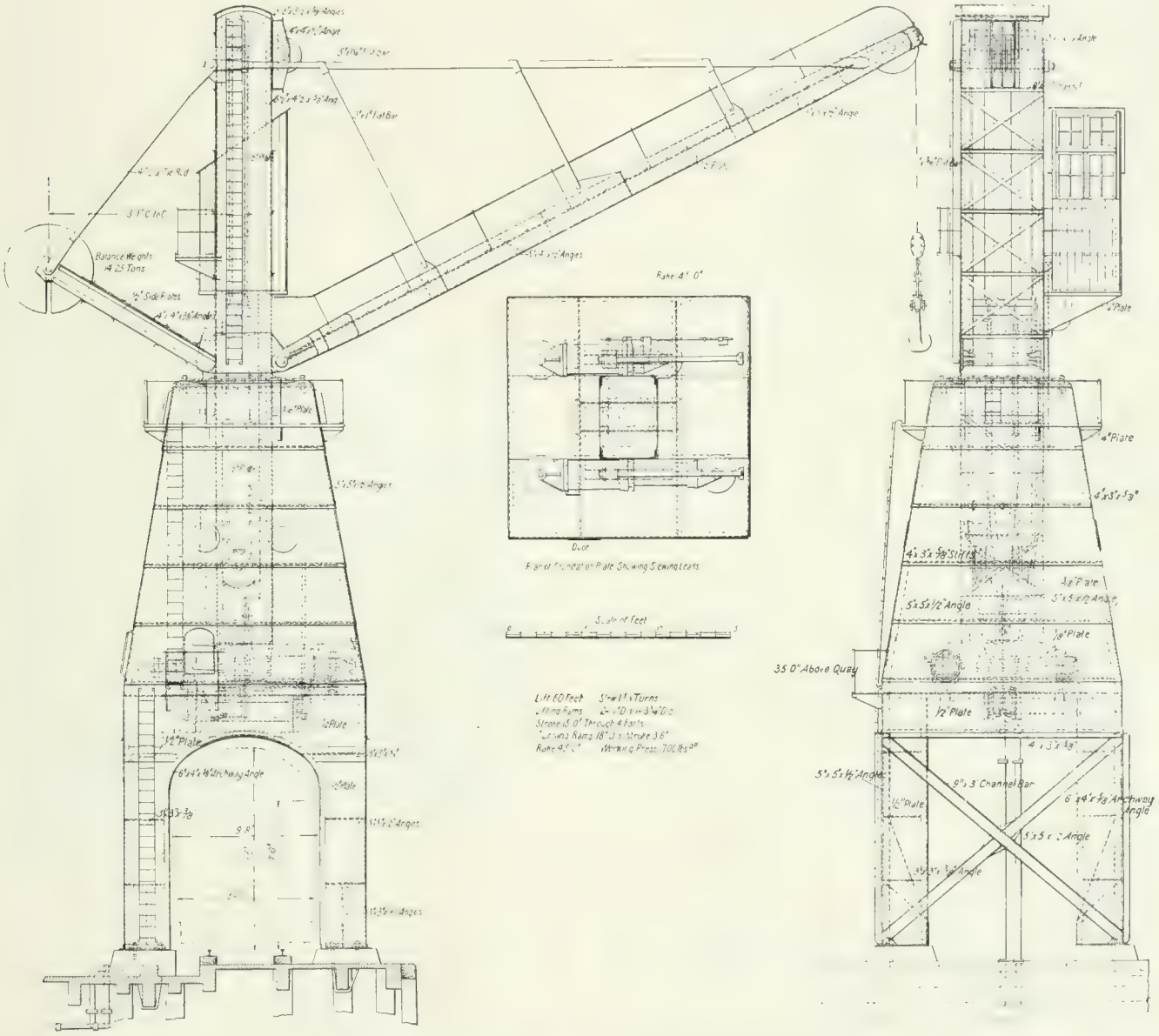
The illustration on page 172 represents a type of 12 portable hydraulic luffing cranes for the Port of London Authority. They have been built by the East Ferry Road Engineering Works Company, Ltd., Millwall, London, E., and are this firm's standard design. They were built to template throughout, thus ensuring interchangeability, as well as accuracy, of the working parts.

The lifting capacity of the cranes is 35 cwts., and at a rake varying from a maximum of 60 ft. to a minimum of 20 ft., they are capable of raising this load through a total height of 105 ft. They are arranged to run upon a crane track of 13-ft. 6-in. centres, the running wheels being fitted with roller bearings, to allow of the cranes being easily moved as required.

All motions, except traversing along the track, are actuated by hydraulic rams and cylinders, each of which is fitted with automatic control gear, thus avoiding the possibility of damage in the event of the pressure not being cut off by the valve before the ram reaches the end of its stroke. The lifting cylinder and ram are installed within the column, that for luffing being attached to the back of same. For the slewing motion, the two cylinders with rams are made fast to the bottom part of the crane, inside the casing, where they operate a plain cast-iron drum attached to the column, the bottom of the latter being carried in a strong cast-iron footstep, with a gun-metal wearing plate which runs in a oil bath to minimise friction.

Chains are used for all motions, except in the case of the derricking where wire rope is used for the rigging between the leap sheave on column and the luffing bar on the jib. Special arrangements are fitted to all chains for the purpose of absorbing shocks when starting under load.

The crane-house, containing the necessary levers for operating the valves, is placed on the side of the column and revolves with the latter. It is readily accessible, and the crane-driver has, at



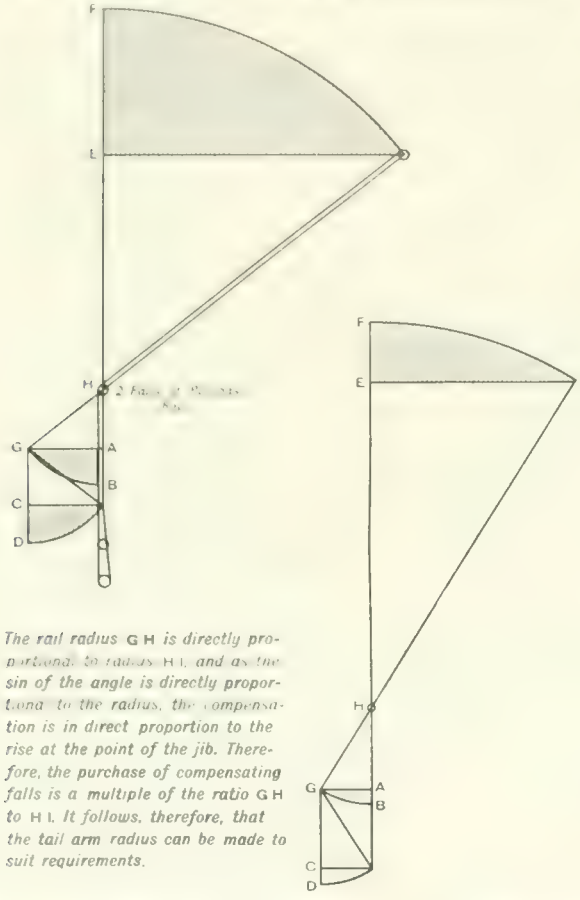
General arrangement of 5 and 15-ton Double-power Hydraulic Cranes, constructed by the East Ferry Road Engineering Works Co., Ltd., for the Port Talbot Docks.

Lift, 60 ft. Slew, 1½ turns. Lifting rams, 2-11 in. diameter, 1 13¾ in. diameter. Stroke, 15 ft. through 4 parts. Turning rams, 18 in. diameter, stroke 3 ft. 6 in. Rake, 45 ft. Working pressure, 700 lb.

all times. A full view of his load, which is easily controlled by him.

Working pipes bring the pressure from the mains to the crane, these being fitted with the usual oscillating connections. The exhaust water from the cylinders is discharged into the dock by means of pipes fitted with swivel connections, by means of which bollards, &c., on the quay are cleared when it is necessary to move the cranes.

These cranes have been installed at the Surrey Commercial, Millwall, and Tilbury Docks, where they have given every satisfaction, the speeds under test being, in every case, in excess of



The rail radius G H is directly proportional to radius H I, and as the sin of the angle is directly proportional to the radius, the compensation is in direct proportion to the rise at the point of the jib. Therefore, the purchase of compensating falls is a multiple of the ratio G H to H I. It follows, therefore, that the tail arm radius can be made to suit requirements.

Diagram Demonstrating the Balance of the Luffing Cranes.

those called for by the specification, which were as follows:—Lifting, with full load, 300 ft. per minute; lowering with chain light, 150 ft. per minute; slewing, at maximum radius, 360 degrees per minute; and luffing with full load, at the rate of 6 ft. per second, either in or out.

Five cranes, embodying Musker & Davison's patent luffing gear, have been installed upon the River Thames by the East Ferry Road Engineering Works Company, Ltd., four for Messrs. Butler's Wharf, Ltd., at the Middleton's and St. Bridge's Wharves, and one for Messrs. W. H. Muller & Co., Ltd., at their Custom House and Wool Quays. Three of those erected for Messrs. Butler's Wharf, Ltd., are of the pedestal type, the fourth being arranged to run on a gantry. All of them are capable of lifting 30 cwts. at 200 ft. per minute to a total height of 65 ft., and of luffing from a maximum rake of 65 ft. to a minimum of 20 ft. at a speed of 200 ft. per minute, measured at the hook. In addition, the cranes are capable of slewing at the maximum rake through $1\frac{1}{3}$ revolutions at the rate of 450 ft. per minute. These are illustrated on page 170.

The crane installed at the Customs House and Wool Quays for Messrs. W. H. Muller & Co., Ltd., differs from the above only to the extent that it is fitted with double-powered lifting cylinders, and is able to lift a load of 25 cwts. at the maximum rake of 75 ft. At a rake of 45 ft. and less it is capable of lifting $2\frac{1}{2}$ tons.

General arrangement drawings of the cranes, with the patent luffing gear, are given on page 170, and it may be convenient here to outline the features which have secured the popularity of the Musker patent. The cranes combine the usefulness of crane and transporter, with the total power consumption even less than that of a transporter. In the case of a harbour crane, where the radius has to be varied at every lift, the saving is inestimable, inasmuch as the power required to alter the radius is only that consumed by friction. The minimum radius can be 12 ft., or less if desired, without any danger of the load overhauling the jib, all parts being balanced. When varying the radius the load remains level, this greatly facilitating the operator in manipulating the load.

The bending of the lifting rope around the various pulleys leads in the same direction, giving a longer life to the rope. The position of the cabin is in front of the crane, enabling the driver to have an uninterrupted view of the hook in almost any position. The derricking speed may be 100 to 400 ft. per minute for a negligible variation of power, and the power required to vary the radius is only a small percentage of that required by an ordinary crane. A

35-cwt. Portable Hydraulic Cranes for the Port of London Authority.

two-ton crane requires only 5-h.p. to derrick 200 ft. per minute. The wheel pressures are less than those of an ordinary crane, as the pedestal, forming part of the crane proper, enables the necessary stability to be obtained without tail ballast.

The general design of the crane gives a large clearance under the jib, which is now found to be an advantage for the larger vessels and close handling. The crane may be the roller path type if desired. The rolling path being on the mast, a larger resisting moment is obtained, and no vertical pull in the centre pin. The ranges of lift below or above the rail level are the same at any radius. The jib is held by the lifting ropes and screw, each independent of the other, and the heavier the pull on the rope the more securely the jib is held.

Generally the crane will perform a much greater duty with less power consumption, and another advantage is that three or even four of these cranes can be employed on one hatchway as the jibs can be easily and quickly luffed to clear the other cranes.

Another interesting type of crane by the same makers are the 5–15-ton hydraulic cranes constructed for the Port Talbot Docks. The general arrangement of these is shown on page 171, and the leading dimensions are given thereon.

GENERAL NEWS SECTION.

PERSONAL.

News is to hand of the death of Captain John Pippett, who had been in the employ of the Moor Line for many years, and had acted in the capacity of master for 13 years. He was 42 years of age.

Midshipman C. W. Croxford, R.N.R., formerly a cadet on the White Star training ship *Mersey*, has received the Distinguished Service Cross in connection with operations at the Dardanelles.

The death is announced of Mr. John Hay, shipowner, Glasgow. Mr. Hay, who was 78 years of age, was head of J. & J. Hay, Ltd., and J. Hay & Sons—the former engaged in the canal and coasting trades and the latter in the coasting and Continental trades.

Captain William Finch, Commander of the ill-fated White Star liner *Arabic*, has had a long and distinguished career, during which he has displayed the finest qualities of seamanship. He entered the service of the White Star Line in 1888 after serving his apprenticeship with Richards. Mills & Co., managers of the Dominion Line. His ability gained for him steady promotion till he rose to the position of commander in 1896. He was appointed to the *Arabic* in 1909. Captain Finch is a retired lieutenant of the R.N.R., and one outstanding instance of his ability occurred in 1908 when he rescued the crew of the *St. Cuthbert* in the Atlantic when that vessel was on fire and during a fierce blizzard. In spite of the heavy sea Captain Finch manœuvred his ship so skilfully that he was able to get near enough to the wreck to take off every member of the crew. For this gallant deed Captain Finch was presented with awards at Liverpool which were made under civic patronage.

Captain W. Finch,
who commanded the *Arabic*.

Second Lieutenant Roy Mackenzie Fernie, of the Royal Engineers Signalling Company, reported killed in action at Ypres on the 18th inst., is the youngest son of the late David Fernie, senior partner of the shipowning firm of Henry Fernie & Sons, Rumford Street, Liverpool.

The Board of Trade have awarded a piece of plate to Mr. Auguste Declercq, skipper of the Belgian steam trawler *Gaby*, of Ostend, in recognition of his services in rescuing the shipwrecked crew of the steamship *Lomas*, of London, which sank in the North Atlantic Ocean on June 30.

Captain Leon Serena Denny, of 7, Welbeck House, Wigmore Street, London, W., second son of the late Mr. William Denny, shipbuilder, of Dumbarton, and of Lelia Lady Samuelson, who was killed in action in Flanders last May, left estate of the gross value of £260,141, with net personalty £39,322.

Mr. C. W. Macilwaine, now of the Fairfield Shipbuilding & Engineering Company, Govan, was recently the recipient of a silver salver and a case of cutlery from the officials, foremen and workmen of Harland & Wolff, Ltd., shipbuilders and engineers, Govan. The chair was occupied by Mr. Campbell, and the presentation was made by Mr. Simpson.

Second Lieut. G. H. Wheatcroft, of the Royal Garrison Artillery, who has been killed in action, was the fifth son of Mr. and Mrs. Wheatcroft, of Wirksworth, Derbyshire. He was educated at Rugby and Cambridge, where he took his degree in engineering. He served as apprentice in Mather & Platt's engineering works, and subsequently went to the Federated Malay States. He was in his 27th year.

The will of the late Mr. Walter Holland, shipowner, and formerly senior partner in the Lamport & Holt Line, shows the gross estate to be £201,512, and net £148,397. Among the bequests are £25 each to the clerks who, at the time of his death, had been in continuous service of the deceased for the previous five years, and the same amount to the marine superintendents and superintendent engineers, and the head wharfinger.

THE GALVESTON HURRICANE.

It is 15 years since the last great hurricane swept the Gulf of Mexico and practically destroyed the port of Galveston. The city was submerged, large steamers were swept miles inland, and the death roll amounted to about 5,000 persons. When the waters subsided the remaining citizens gathered their dead and conveyed them in barges to the deep waters of the Gulf. Then they rebuilt their city, and to prevent a recurrence of the catastrophe raised the whole of the city level by 15 ft. The fact that the average level of the island above the sea level is 7 ft. explains the necessity for this.

Last week another terrific storm struck the town, and though the loss of life was comparatively small, shipping in the harbour was dispersed in all directions, and the damage to property was great. Several British steamers were in the port at the time, having recently arrived to load cotton for home. It is too early to speak with certainty of these casualties, but from the brief reports already received it is evident that underwriters will have to face heavy settlements for repairs and salvage charges.

Brief details of the most serious cases are given below, the value referred to being the insured value :—

SS. *Hawkhead*, owned by Crawford & Rowat, Glasgow, 4,622 tons gross, built in 1912, value £50,000. Ashore north side Galveston Channel. Contract made with only available dredger for $5,000 on "no cure no pay" basis.

SS. *Ribston*, owned by R. Sargeant & Sons, West Hartlepool, 3,048 tons gross, built in 1906, value £26,000. High and dry 4 miles from deep water.

SS. *Harlesden*, owned by J. & C. Harrison, 4,434 tons gross, built in 1909, value £42,000. High and dry 6 miles from deep water, upper works damaged.

SS. *Eaton Hall*, owned by E. Nicholl & Co., Cardiff, 3,711 tons gross, built in 1904, value £38,200. High and dry 6 miles from deep water, upper part damaged.

SS. *Wallace*, owned by Taylor & Sanderson, Sunderland, 3,930 tons gross, built in 1905, value £44,275. Ashore 2 miles from channel.

SS. *Sarah Radcliffe*, owned by Evan Thomas Radcliffe & Co., 3,333 tons gross, built in 1896, value £27,000. Rudder damaged and leaking badly.

SS. *El Sud*, owned by the Southern Pacific Company, New York, 4,572 tons, built in 1899, value £85,000. Stranded, pounding heavily; water in three holds.

SS. *Upo Mendi*, owned by Sota y Aznar, Bilbao, 3,838 tons gross, built in 1911. Ashore near Houston Ship Channel.

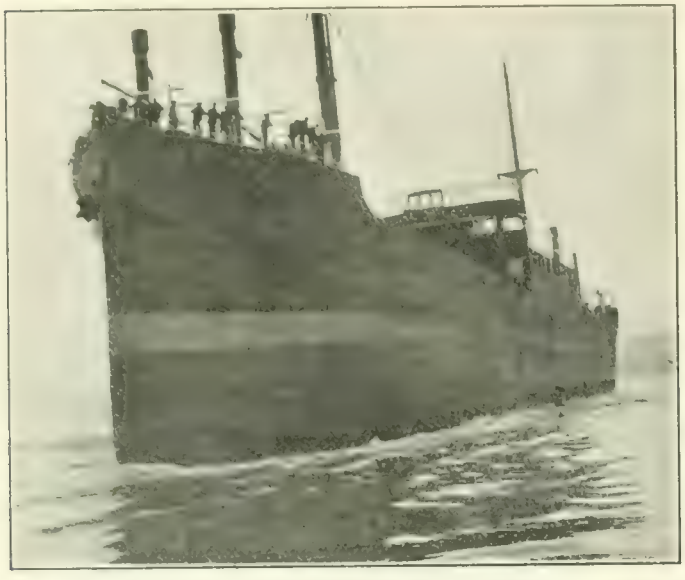
Barque *Port Sowachan*, owned by Pablo Roid, Monte Video, 1,154 tons, built in 1885. Adrift with full cargo of cotton.

SS. *Campania*, owned by D. Tripcowitch, Trieste, 3,551 tons gross, built in 1901. Damaged.

SS. *Morawitz*, owned by the Atlantica Sea Navigation Company, Fiume, 4,795 tons gross, built in 1907. Ashore Redfish Reef.

LAUNCH OF THE "MACEDON."

The accompanying illustration shows the launch which took place on August 16 by William Hamilton & Co., Ltd., Port Glasgow, of the ss. *Macedon*, a duplicate of the ss. *Chaucer*, recently completed for the Ambrose Steamships, Ltd. (Howard Smith, Ltd., Melbourne, managing agents), a third vessel, the ss. *Dan Dawes*, being still to be completed. The vessels of the following dimensions:—378 ft. in length by 51 ft. 6 in. in breadth by 28 ft. 6 in. depth to upper deck, has a deadweight capacity of 9,670 tons on a draught of 23 ft. 6 in., and is fitted with all the latest appliances for the rapid handling of cargo, having 16 horizontal and 4 electric winches working in conjunction with 20 steel derricks and guys. The vessel is of the two-deck type with poop, bridge and forecastle, and designed with wide-spaced tubular



The "Macedon," Launched at William Hamilton & Co's. Yard, Port Glasgow, recently.

pillars clear of hatches. The water ballast capacity is 1,330 tons. The vessel will be fitted with machinery by David Rowan & Co., Glasgow, consisting of triple-expansion engines having cylinders 25½, 42, 70 by 48-in. stroke, and three single-ended boilers 16 ft. in diam. by 11 ft. 3 in. long, 180 lb. working pressure, designed for the consumption of inferior coal to give a sea speed loaded of 10½ knots. The vessel is classed 100 A1 with Lloyd's Registry, and has been constructed under the supervision of Mr. W. E. Forster assisted by Mr. J. K. Ramsay.

ORDERS PLACED.

The Mersey Docks and Harbour Board have placed a contract with Sir W. G. Armstrong, Whitworth & Co., Ltd., for three pairs of dock gates for the Gladstone Dock river entrance locks, now in course of construction.

According to newspaper reports the Wilson Line, of Philadelphia, has ordered a cargo steamer for Delaware River trading from the Harlan & Hollingsworth Corporation. The new boat will be 192 by 32 by 11·8 ft. draught and will, it is said, cost about $250,000.

Two oil tankers have been ordered from the Harlan & Hollingsworth Corporation, Wilmington, Del., by the Standard Oil Company, of New York. The new boats will be almost similar to the three tankers recently ordered of the same works by the Anglo-Saxon Petroleum Company, of London. They have a capacity of 8,500 tons dw., and measure 425 by 59 by 30 ft. The cost of each of the two Standard Oil tankers is said to be about $500,000.

It is reported that the Newport News Company has booked further orders for two tankers for the Standard Oil Company, of New Jersey, which will be delivered in about 18 months. They will be 500 ft. long, 68 ft. beam, 38 ft. deep, and will cost in the neighbourhood of $1,000,000 each. The Newport News Company is at present building for the same owners three oil tankers of the same dimensions which are to be named the *Charles Pratt*, *Antwerpen* and *H. H. Rogers*, respectively.

PORT NOTES.

Hobart, Tasmania.—The accounts for 1914 show total receipts £26,607, and after meeting current expenses there remained a balance of £1,262. Expenditure on capital improvements amounted to £29,000.

Santa Cruz, Teneriffe.—The construction of the mole at Santa Cruz, Teneriffe, is progressing steadily, and large steamers are now enabled to lie alongside to discharge a load cargo. According to a Consular report, just published, the condition at the end of last year was: Length of mole, 2,691 ft.; average width, 70 ft.; depth alongside available for steamers, 14 to 27 ft. There are four cranes to lift from 3 to 50 tons. There are 10 fathoms or more of water at the entrance to and in the port, and the harbour is supplied with mooring buoys.

Port Limon (Costa Rica).—The approximate annual tonnage of coal used in Port Limon is about 50,000 tons, practically all imported from the United States. This coal usually comes in cargoes of about 4,000 tons. The two wharves at Port Limon afford facilities for unloading or loading four to five vessels of 5,000 tons register at the same time. The depth of water is 20 to 28 ft. Each ship can discharge 500 tons daily. The port charges are as follows:—Pilotage (not necessary), $14; tonnage, ships 2,000 tons or under, $23·26 ($1 for each additional 100 tons, maximum $30); Costa Rican bill of health, $2·79; wharfage, per day, $30; springs, per day, $7 each; buoys, per day, $4·50 each; derricks, per day, $4·50 each. The only coal used at the present time is imported by the Northern Railway Company.

Port Kembla.—The opening of the new Government low-level jetty at Port Kembla, on the New South Wales south coast, will mark a new era in the coal trade of this State. For many years the industrial progress of the district has been hampered by lack of proper facilities for the handling of the coal and coke. The Government, in 1896, sanctioned the harbour construction at Port Kembla, which was commenced in 1901 and is now approaching completion. The jetty runs out to a depth of 30 ft. at low water. It is 1,400 ft. long, and it cost £90,000. The new loading plant will deliver coal into the ships' holds at the rate of 750 tons per hour, and if future trade warrants it, the plant can be duplicated to permit of loading on both sides of the jetty simultaneously. Close by, the railway company have constructed an immense siding for the accommodation of a greatly increased coal and coke traffic.

New York.—The Dock Commissioner has awarded the contract for the construction of the new pier at the foot of Thirty-fifth Street, South Brooklyn, the dimensions of which will be 1,739 ft. long by 175 ft. wide, containing an area of 304,325 sq. ft., to George B. Spearin, at $309,201. The award of this contract completes the preliminary work of bringing about the construction of the three new piers by the city on the South Brooklyn waterfront, which, when completed, will add 8,526 lineal ft. and an area of 565,914 sq. ft. to the wharfage facilities of that district. The contract for the construction of the new pier at the foot of Twenty-ninth Street, South Brooklyn, has been awarded to Henry Steers (Inc.), at $116,148. This pier will be 1,215 ft. long by 80 ft. wide, containing an area of 97,200 sq. ft. The contract for the construction of the pier at the foot of Thirtieth Street was awarded to W. P. Seaver (Inc.), at $196,263. This pier will be 1,324 ft. long by 125 ft. wide, containing an area of 165,000 sq. ft.

New Orleans.—Considerable opposition has developed to the new traffic rates worked out by the Board of Port Commissioners of New Orleans. At the extra session of the Legislature the Dock Board was given permission to revise the tariff of charges, and after a thorough survey of the field, there and elsewhere, it was decided to change the system of charges materially, the new system roughly speaking, placing the tariff on the freight rather than on the carrier. This change was made in the belief that taking the tariff off the ships and putting it elsewhere would induce a greater number of vessels to seek this port. The tariff of rates having been published, however, opposition at once sprang up among the parties in interest, and a conference was held in the office of the Dock Board recently, at which a large number of prominent shippers, transportation men, importers and others were present. It is understood that some of the steamship companies are opposing the change, though it was made primarily in their interest. It is believed the result of the conferences will be a material change in the tariff as published.

FROM OUR CORRESPONDENTS.

CLYDE AND DISTRICT.

(From Our Own Correspondent.)

Glasgow.

The report which comes from the steel trade that there have been a good many inquiries made during the past week or two with regard to shipbuilding material seems to confirm certain rumours which have been current with regard to the placing of contracts with those shipbuilders who are not exclusively engaged on Admiralty work. Orders for two oil-tank steamers are said to have been placed on the river recently, one with the Greenock & Grangemouth Dockyard Company and the other with Russell & Co., Port Glasgow, while the Caledon Company of Dundee are also reported to have booked a similar contract. A report comes from the lower reaches of the Clyde to the effect that several contracts for handy-sized cargo carriers have been or are about to be placed with Greenock and Port Glasgow firms, but details are lacking, as shipbuilders and shipowners are alike reticent with regard to the matter at the present time.

Speeding Up in Shipyards.

The Clyde District Committee of the Amalgamated Society of Engineers have arranged to send squads of skilled workmen on Saturdays and Sundays to shipyards and engineering shops where urgent work is being carried on with a view to relieving a corresponding number of men who have been working day after day without interruption for many months. It is felt that these men cannot work up to their normal output unless they are allowed a day or two of rest occasionally. The arrangement made by the District Committee is to draft in men from workshops in which no overtime or night shifts are in operation and to send them to relieve men who are in need of recuperation. A start was made with this scheme on Saturday and Sunday, and the practice will be continued and extended as time goes on. Already over 600 engineers have volunteered to relieve their fellow-workers in establishments where urgent contracts are being carried out.

Ship-Repairing on the Clyde.

Ship-repairing still continues active at Greenock and Port Glasgow. Last week the Greenock & Grangemouth Dockyard Company commenced the overhaul of the large steamer *Waltham*, which arrived recently in the Clyde with a cargo of sugar. George Brown & Co. have dry-docked a small vessel for repair, while James Lamont & Co. have the coaster *Ashdale Glen* on hand in the East India dry dock. The last mentioned firm have just completed the overhaul of the West Highland steamer *Chevalier*, which left the Garvel dry dock last week after having had a number of plates renewed on her hull. The steam yacht *Transit* is also being repaired at Greenock. There are very few vessels in the hands of repairers at Glasgow.

Special Port Committee for Glasgow.

The Government have appointed a special committee, consisting of Mr. Francis Henderson, shipowner, Glasgow; Colonel L. Forde, and Commander D. Agnew, R.N., naval transport officer, Glasgow, for the purpose of co-ordinating the naval, military and civil requirements of the port. Mr. D. M. McIntyre, of the Clyde Trust, will act as secretary to the body. The chief duty of the committee will be to ensure that the best possible use is made of the facilities available at Glasgow for naval and military purposes. A committee has been at work for some time on similar lines at Liverpool. There has so far been practically no congestion of traffic at Glasgow harbour, but the facilities of the port have frequently been taxed to their fullest extent.

THE NORTH-EAST COAST.

(From Our Own Correspondent.)

Newcastle-on-Tyne.

The energies of shipbuilders continue to be concentrated upon work which directly, or indirectly, have a connection with naval requirements, and purely commercial tonnage which is not likely to have any bearing upon contingencies which may suddenly arise in shipping concerns, owing to the war, is not being proceeded with. There are, of course, several meat-carrying and oil-tank steamers, under construction and others recently arranged for, but the present is not quite the time to give any further indication of their type, size or place of building. The scarcity of labour continues, although upon application to the War Office, a fair number of skilled men have been recently brought from Flanders back to their civil employment in engineering or shipbuilding yards. Such men, in the vast majority of instances, enlisted in the early days of the war and they have therefore gone through several months' training. They are allowed to retain their Army pay as soldiers—without separation allowance—and in addition, receive the ordinary rate of pay in the particular trade in which they are now engaged. Great importance is now attached to cases of absenteeism. There have, during the past 10 days, been several prosecutions by the employers, and in every case nominal fines, which have had a salutary effect have been inflicted. In connection with the scheme of the Central Control Board for the provision of canteens for munition and transport workers, the Admiralty have lately arranged for an old battleship to be placed at the disposal of the Armstrong firm for the convenience of the Elswick workers.

MERSEY SHIPPING AND SHIPBUILDING.

(From Our Own Correspondent.)

Liverpool.

In the quarterly statement just issued by the Liverpool Underwriters' Association there is given a list of the more important casualties which occurred in the three months ended March 31. The total loss resulting from steamers is returned at £6,353,700, as compared with £1,130,000 in the same period of last year, and £2,315,500 in the first quarter of 1913. Losses of sailing ships amounted to £700,100, as compared with £142,000, and £204,000 in the two preceding periods. To the war is attributed the loss of £3,485,900 on account of steamers, and £469,000 on account of sailing vessels.

It has now been officially acknowledged by the Admiralty that the steamer *Cottingham*, owned by James Little & Co., of Belfast, and commanded by Captain Colin Mitchell, sank a German submarine during the early part of July. This follows upon an examination of the *Cottingham* in dry dock when damage was found consistent with the claim made by Captain Mitchell. The Admiralty have forwarded a cheque to Captain Mitchell to be distributed amongst the officers and crew, and this will also entitle Captain Mitchell to lay claim to other substantial awards that have been offered for the destruction of enemy submarine by unarmed merchant vessels.

The Manchester Ship Canal traffic continues to expand under pressure at neighbouring ports. The July traffic receipts are up by £7,223, and the total increase for the seven months of this year is now £40,230.

SOUTH WALES NOTES.

(From Our Own Correspondent.)

Cardiff.

In view of the Exchange problem and the fact that the Government has intimated to traders and the public the necessity of paying accounts wherever possible by cheque or notes and to place all gold into the banks, a letter written by Mr. Marshall, Secretary of the Swansea Chamber of Commerce, to the Association of Chambers of Commerce of the United Kingdom, sheds new light on the subject, and is of particular interest to shipbrokers. It is pointed out that a member of the Swansea Chamber of Commerce reports that the captain of a foreign-owned steamer made a request for an advance out of his freight of £100 in gold. On the following day another £100 in gold was asked for, but this was refused and notes offered. This, says the letter, points to a possible outlet for large quantities of gold leaving the country, as no doubt foreign captains, and perhaps British captains, can get a very good exchange for British gold abroad, and make the export of this metal a very profitable transaction. The Association of Chambers of Commerce has sent a copy of the letter to the Secretary of the Treasury, but at the same time would like to know how the shipowners obtain the gold which they pay to foreign captains inasmuch as the banks have been instructed by the Treasury only to pay notes. The Association, as notes are legal tender in this country, ask if foreign captains refuse to take notes.

Swansea Spelter Works.

The Swansea Vale Spelter & Zinc Smelting Works, until recently a German concern, has now been taken over by an entirely English group with the consent and approval of the British Government. The works are quite new and arranged upon modern principles and

[illegible]

[illegible]

Dry Dock Returns.

[illegible] The Bute Shipbuilding & Engineering Company, Ltd., were occupied throughout July with [illegible] The Mountstuart Dry Docks, Ltd., are carrying out very extensive bottom work on the steamer [illegible] Messrs. John Shearman & Co. were in the same position with the steamer *Clutha River*. [illegible] docked last month against 131 vessels of 362,153 tons in July, 1914, as [illegible] of 67 vessels of 197,102 tons. Figures for each port are [illegible]:

Port	July, 1915		July, 1914	
	Vessels	Gross Tons.	Vessels	Gross Tons.
[illegible]	7	[illegible]	71	192,799
[illegible]	73	[illegible]	25	[illegible]
[illegible]	22	[illegible]	10	[illegible]
[illegible]	5	[illegible]	1	[illegible]
[illegible]	[illegible]	[illegible]	2	[illegible]
[illegible]	24	[illegible]	19	[illegible]

Ship Repairing.

A number of exceptionally heavy jobs having been completed, repairing work is not quite so active. This, however, does not mean that slackness is being experienced. Indeed the work at present in hand is sufficient to keep repairers busily employed. The Bute Shipbuilding & Engineering Company having completed extensive bow damage repairs to the Greek steamer *Gerasimos*, are now busy with bottom work on the large auxiliary steam barque *Neva*, formerly the German-owned ship *R. C. Rickmers*, the largest vessel of her class in the world. The Mercantile Pontoon Company, Ltd., have also completed heavy bow repairs to the steamer *Theodora Silvertas*, which was in collision with the *Gerasimos*, the damage to which vessels was illustrated in your issue of August 5, and are now working on the steamers *Hopehill* and *Freeman*. The Cardiff Channel Dry Docks & Pontoon Company, Ltd., are overhauling the steamer *Westgarth*, while Messrs. John Shearman & Co. are still busy with bottom damage to the steamer *Clutha River*. Hills' Dry Docks & Engineering Company, Ltd., continue well employed with extensive bottom work on the steamer *Woodbridge*, while the Mountstuart Dry Docks, Ltd., are carrying out very heavy bottom and internal repairs to the steamer *Kingsway*, stem damage to the steamer *Penrhyn*, and machinery work to the steamer *Mercator*. At Newport, Swansea, and Barry work, though generally consisting of minor repairs, is brisk, and each individual concern is fully occupied.

Swansea Tippers' Dispute.

The dispute between the Swansea tippers and the tipowners was settled on Monday, and work was resumed on Tuesday morning. The pooling arrangements and the men's grievances are to be the subject of future negotiation.

The Cardiff and Bristol Channel Shipowners' Association on Monday passed a resolution supporting the scheme of the Cardiff Railway Company, the object of which is to improve facilities at the Bute (Cardiff) Docks. The scheme was outlined in last week's South Wales Notes.

Shipping in Marseilles. According to *Le Semaphore* there entered the port of Marseilles during the first six months of this year, 6,000 vessels totalling 7,251,573 tons burden, with 4,019,099 tons of merchandise and 197,801 passengers. As compared with returns for the corresponding six months in 1914, there is a reduction in arrivals of 2,664 vessels, of 3,617,578 tons burden, of 940,963 tons of merchandise and of 25,927 passengers. The 226,600 tons of merchandise imported from Germany during the first six months of 1914 and the 161,000 tons imported from Austria have suffered complete elimination, but imports from Great Britain have increased by more than 507,000 tons (53 per cent.), and those from Japan by 36,000 tons (170 per cent.).

THE FREIGHT MARKETS.

(From Our Own Correspondents.)

London.

After a further period of marked quietness in most sections of the tramp market, it is satisfactory to note that at last there are signs of more activity. Charterers both in America and in the Plate are now inclined to consider offers. At the moment the Eastern markets are not more than steady, and there is slowness in the Plate. As to the Gulf, it may be assumed that this section will be having some movement in October. As a matter of fact we are now approaching the period of the year when the owners of tramp tonnage look to find a good demand for their vessels for homeward loading. From the Plate the *Evangelos*, 5,000 tons, 10 per cent., has been fixed at 63s. 9d. to the United Kingdom, option Rotterdam, 68s. 9d. September. The *Sophia*, a slightly larger vessel, gets the same rates for September-October. Coal from the United States will pay 42s. for prompt vessels to West Italy, while 44 to the Plate 34s. 6d. is about the figure. To Marseilles for this business a vessel has been taken up at 36s. 6d. For grain business, the *Dart*, 21,000 quarters, 10 per cent., has been closed from New York at 10s. 3d. to Malta, Piræus, Volo, Patras or Salonica, September 10-30. From the Northern Range 10s. 3d. can be had for September for West Italy for grain. From the East charterers' ideas are on the level of 52s. 6d. from Bombay for ore to United Kingdom or Mediterranean. From the Philippines 110s. has been paid for a vessel, copra basis. There are inquiries for tonnage to load at Newcastle, N.S.W., at 20s. to Guaymas and at 18s. 9d. to San Francisco. From Bilbao the *Durango*, a 4,200-tonner, has been conceded 10s. to Heysham. Still continues the upward tendency of outward coal freights from the Tyne. Tonnage of all classes is becoming pronouncedly scarce and this, of course, has resulted in handicapping business. To Marseilles up to 28s. has been paid, and the same figure can be obtained for large carriers for Genoa. For vessels of a more handy size 30s. is asked for the last-mentioned port. To the Piræus 30s. has been conceded, and to Algiers 24s. Havre stands at 15s. and Rouen at 16s. Up to 8s. has been asked for London. A moderate amount of activity, combined with a stronger tone, is reported from Cardiff. Representative fixtures are:—Alexandria, 26s. 6d.; Rouen, 15s.; Las Palmas, 17s.; Rio Janeiro, 21s.; and Naples-Leghorn, 25s. Newport to Algiers has paid 28½ fr. to the *Leon*, a 3,400-tonner. Hull to Rouen has been closed at 16s.

Glasgow.

The feature of the Glasgow market during the week has been the steadiness of the outward coal trade. Tonnage to the Mediterranean and elsewhere has been in good demand and rates advanced slightly. A Glasgow steamer was fixed for Aden at 27s. From Wales 25s. was paid for Port Said, and 32 fr. for Marseilles. The export coal trade from Glasgow is exceptionally busy, and this week there are several vessels waiting the turn to load. In the time charter business rates were also firm at about 15s. for Transatlantic business. Time charter, Brazil-River Plate trade, 14s., one round voyage, delivery and re-delivery, north of Hatteras, August; time charter, general trades, 15s. six, option eight months, delivery and re-delivery United Kingdom; time charter, White Sea trade, 950 standards, 26s. on deadweight, one round voyage, "Baltime" charter. Homeward business from the River Plate was quiet at 65s. for September boats, and 62s. 6d., October, from Lorenzo range to the United Kingdom. In the American trade tonnage was scarce and very little business was reported. In the East Karachi fixed at 41s. to the United Kingdom.

Newcastle-on-Tyne.

The local coal freight market has been unusually active during the past week, despite the great and growing scarcity of steamers. The Newcastle coal market has been very dull and stagnant, but the inquiry for tonnage has been well maintained, with the result that rates have markedly improved. The opening-out of loading turns, too, has tended to increase rates. In the early part of the week, coasting prices fell considerably and London was done at down to 6s. Latterly, however, an advancing tendency has set in and the latest rate indicated is 7s. 6d., an increase of 6d. on last week's figures. Rates for North France have materially stiffened; Dunkirk is from 1s. to 1s. 6d. advanced, Havre 2s. 3d. up, and Rouen from 2s. 9d. to 3s. 6d. increased. In the Bay, quotations for Bordeaux have shown a welcome improvement, and about 21s. is now asked, an advance of up to 4s. on last week's prices, whilst

Nantes is 1s. 9d. better. Mediterranean-wards, there is a good inquiry for large steamers to load gas coals, but these are scarce and, therefore, held for increased prices. Marseilles has been fixed for at up to 28s., and Genoa is from 2s. to 2s. 6d. advanced. Fixtures arranged since last report include the following:—Algiers, 2,800, 22s. 6d.; 5,200, 24s.; 600, 1s.; Bordeaux, 2,100, 20s.; 2,800, 20s. 6d.; Caen, 600, 21s., coke; Calais, 300, 20s.; coke; Dunkirk, 1,500, 14s.; 2,500, 14s. 6d.; Genoa, 4,500, 25s.; 7,500, 26s. 6d.; 7,800, 25s.; Gibraltar, 2,400, 17s. 6d.; Havre, 1,500, 14s. 6d.; 800, 15s.; London, 900, 6s. 9d.; 1,700, 6s. 7½d., from Derwenthaugh; 1,200, 6s.; 500, 7s. 6d.; 1,000, 7s.; 1,800, 7s. 6d.; 2,500, 7s. 6d.; Las Palmas, 1,500, 17s. 9d.; Marseilles, 2,300, 28s.; Nantes, 1,800, 18s. 6d.; Naples, 6,000, 26s.; Oran, 2,500, 21s. 6d.; Piræus, 3,200, 30s.; Rouen, 1,800, 14s.; 1,600, 15s.; 1,650, 16s.; 1,650, 14s. 9d.; Rochefort, 2,500, 19s. 6d.; 2,100, 20s.; St. Servan, 500, 14s., two voyages; Treport, 500, 20s., coke; Valencia, 1,400, 25s., coal and coke.

Liverpool.

Outward business on this market rules quiet, but this is not due to any sign of weakness in any of the outward trades. If anything tonnage is being held rather for better terms in sympathy with the firmer rates to the Mediterranean. Time charter rates are well held, on a steady inquiry for boats. Twelve months in the Mediterranean trade has paid 13s., and the *Moldavia* has been fixed for two years' general trading at 14s. Boats are being inquired for in other trades, and firmer rates are indicated. Homeward freights are generally steady, without any market being particularly busy. North America would seem to be in need of tonnage, and higher coal freights are offering at Virginia, which may not be without effect on grain rates. Up to 41s. 6d. is offering for coals to Genoa, 37s. 6d. to Marseilles, and 43s. reported to Salonica. To West Italy heavy grain is offering at 11s. 6d. from the Gulf, September-October, 10s. to 10s. 3d. from Northern Range, and 10s. 6d. from Montreal. River Plate has gone very quiet, but this, it is believed, will only be for a brief period. Eastern markets keep very steady around 77s. 6d. to 80s. from Kohsichang to United Kingdom, and 77s. Saigon to France. India quiet and unchanged; Bombay quoting 52s. 6d. on deadweight to United Kingdom, Calcutta 70s. net to United Kingdom, and Madras 75s. to Marseilles. Barley from Karachi still done at 40s. Mediterranean homewards steady with a better outlook for ore tonnage, and more inquiry from Alexandria. Ore from Bilbao to Heysham paid 10s. Nitrate ports steady at 80s. to United Kingdom or North France for up to March loading. In the sailing ship trades business is very dull and homeward rates have not the strength they recently had.

Cardiff and Swansea.

All departments, except South America and Brazil, maintained a very strong tone and chartering was exceptionally active, steamers to carry 211,850 tons being fixed to load at Cardiff, Penarth, Barry or Newport during the past week, or no less than 105,570 tons more than in the preceding six days. Tonnage of 59,090 tons capacity was taken to load at Swansea or Port Talbot, an improvement of 27,490 tons over the previous week. July charterings from Cardiff were 527,860 tons, against 1,268,290 and 1,287,570 tons respectively in July, 1914 and 1913, while Swansea's total last month was 192,670 tons compared with 245,450 and 238,400 tons in July, 1914 and 1913, respectively. Though tonnage was in good supply the demand was very active and rates as a result were easily maintained for the Mediterranean from Cardiff, and in some cases substantial advances were recorded. Fixtures concluded since the last report are Algiers, 26 fr. (twice), 28½ and 27 fr.; Alexandria, 26s., 26s. 6d. (three) and 26s. 4½d. (all 500 tons delivery); Barcelona, 20s.; Bizerta, 25 fr.; Genoa, with options, 23s. 6d., 24s., 24s. 6d. (twice), 25s. 3d. and 25s. (twice); Gibraltar, 15s. net, 16s. 6d., 17s. 6d. and 17s.; Lisbon, 18s. (three, all 350 tons delivery) and 18s., 17s. 6d. (twice, 500 tons delivery); Leghorn, 22s. 6d.; Marseilles, 26, 32 fr. (three), 31¼, 31 and 32½ fr. (option, Swansea loading); Naples, 20s. 10½d. (1,000 tons delivery), 25s. 3d. and 22s. (both 800 tons delivery); Naples or Leghorn, 25s. (800 tons delivery); Palma, 20s. 6d.; and Port Said, 25s. and 26s. A very strong tone also pervaded the Bay and Coast sections and orders were more numerous and urgent than for many months past, while tonnage, though in good supply, was firmly held for top rates which ruled on the basis of Boulogne, 14s. 6d. and 15s. 1½d.; Bordeaux 22 fr. (twice) and 21 fr.; Brest, 12s.; Caen, 14s. (twice); Calais, 14s. 6d.; Honfleur, 14s.; Dieppe, 14s. and 14s. 6d.; La Rochelle, 21 fr.; L'Orient, 16s.; Nantes, 23 fr.; Rouen, 15s. (eight); Rochefort, 22 fr. (twice); St. Nazaire, 21½, 21 fr. (twice), 18 fr. (large steamer) and 19½ fr.; St. Malo, 13s.; Sables d'Olonne, 22 fr.; and Trouville, 14s. 6d. South American business was slow, and with the demand poor rates ruled weak, Bahia Blanca option Buenos Ayres fixing at 22s.; River Plate, 21s., option Rio de Janeiro 21s. 6d.; and Rosario, 22s.; while Las Palmas was done at 17s. Eastern chartering was confined to Djibouti, at 27s. 6d. The Swansea market was active and firm, Bordeaux fixing at 24 fr.; Cherbourg, 15s.; Dieppe, 15s.; Havre, 12s. 6d., 14s. 6d. and 13s.; Rouen, 15s. (three), 15s. 3d. and 15s. 6d. (twice); and St. Malo, 13s.; while for the Mediterranean, Genoa conceded 23s. 9d.; Marseilles, 27½ and 31½ fr.; Messina, 24s. 9d.; and Spezia, 25s. While for Scandinavia, Sundsvall was done at 18s. A comparatively large number of vessels were fixed to load at Port Talbot—which is significant in view of the continued idleness of nine tips at Swansea—including Bordeaux at 23 and 22 fr.; La Pallice, 20 and 22 fr.; Nantes, 21 and 22 fr.; Rouen, 15s.; and St. Servan, 12s. 9d.

Hull.

The market is very strong with rates in the Mediterranean direction advanced from 22s., paid last week, to 26s. for Genoa from Hull. In the short trades a strong tone is pervading the market and rates are based on 16s. to 16s. 6d. for Rouen from Hull, 14s. 6d. to 15s. for Dieppe from Hull, 15s. to 15s. 6d. for Dieppe from Goole, 15s. for Honfleur from Hull, 7s. 6d. for London from Hull, and 7s. 6d. to 8s. for London from Goole. The demand for tonnage for the coasting destinations is good. In the River Plate market business is slow, with 24s. 6d. quoting for Buenos Ayres from Hull.

COMPANY REPORTS.

Penarth Harbour Dock & Railway Company, Ltd.—The directors, in their half-yearly report to June 30, propose the payment of the usual dividend at the rate of £5 5s. per cent. per annum.

John Spencer & Sons, Ltd.—The report shows net profit for the year, after payment of debenture interest and preference dividend and including amount brought forward, of £81,767. The directors propose to pay a dividend of 3½ per cent. (making 6 per cent. for the year), subject to tax, placing to bad debt fund £2,000; renewals and improvements expenditure, £12,929; depreciation, £15,000; reserve fund, £10,000; and carrying forward £20,237.

Seaham Harbour Dock Company, Ltd.—The report for the half-year ended June 30, states that shipments of coal amounted to 785,200 tons. The balance of profit is £8,849, amount brought forward, £8,512; and interest on bank balances and transfer fees, £29; making £17,390. Debenture and other interest absorbed £3,634, reserve fund for renewals, £500; directors' fees for 1914, £500, leaving to the credit of net revenue account £12,756. The dividend due to the preference shareholders is £5,062, leaving balance to carry forward £7,693. Owing to largely decreased colliery outputs and to higher wages and working costs the directors regret that the profits do not admit of any dividend being paid on the ordinary shares.

Canadian Pacific Railway.—The report for the year ended June 30 shows gross earnings, $98,865,209, and working expenses, $65,290,582, leaving net earnings, $33,574,627. After deducting fixed charges, $10,446,509, there remains a surplus of $23,128,117, and after the payment of dividends, interest and other appropriations, there remains $21,508,965. Reference is made to the changes in steamship management as follows:—"The directors have had under consideration for some time the desirability of transferring to a steamship company the steamships engaged in traffic on the Atlantic and Pacific Oceans, the more effectually to separate the railway and steamship finances and operations. To that end a company has been organised under the laws of Great Britain, known as "The Canadian Pacific Ocean Services, Ltd.," with an authorised capital of £2,000,000 sterling, having for its purpose, amongst other things, the acquisition and operation of ocean steamships and the interchange of traffic with the railway lines and others. The requisite extension of the company's charter powers has been secured to enable it to hold stock and securities of the Canadian Pacific Ocean Services, Ltd., and to guarantee payment of the principal and interest of such securities as may be issued. It is proposed that the Canadian Pacific Ocean Services, Ltd., shall purchase and take over the company's interest in all of the steamships and their appurtenances engaged in ocean traffic, as well as those of the Allan Line Steamship Company, which has been under this company's control for some time. A moderate estimate of the value of the steamship property involved in the transaction, after making due allowance for depreciation, is £23,500,000. The directors recommend that as a consideration for the steamships

and their appurtenances to be sold and delivered by the company, and for the capital stock of the Asia Low Steamship Company, carrying with it all that company's steamships and other properties, such stock to be paid for by the capital stock of the Canadian Pacific Ocean Services, Ltd., namely $1,962,900, being all (excepting the shares necessary to qualify the directors of the steamship company, and, in addition, 5 per cent first debentures or debenture stock of the Canadian Pacific Ocean Services, Ltd., to the amount of £2,850,800 sterling. The transaction has been completed on this basis, subject to approval. Six of the company's older class steamships—namely, the *Montrose*, *Mount Royal*, *Monmouth*, *Monteagle*, *Lansing* and *Kildonan*—were taken by the Imperial Government in November last, at a price that has not yet been fixed by the Admiralty, and the steamship *Empress of India*, after 25 years' service on the Pacific Ocean, was sold for £85,000 and converted into a hospital ship. Two large motor steamships that were under construction at Belfast were purchased by the company at a cost of about £700,000 for delivery in July and October of this year. Pressure of other work, however, delayed their completion, and it will be probably some months before they are ready for service."

NEWS PARAGRAPHS.

U.S.A. Registry.—The total number of foreign-built ships admitted up to the end of July to United States Registry under the Act of August 18, 1914, was 150 of 528,408 tons gross.

Clyde Liquor Restrictions.—The restrictions on the sale of liquor in the West of Scotland enforced by the Central Board of Control, came into force this week. Public houses were only open from 12 to 2.30 p.m. and from 6 to 9 p.m.

The Australian Submarines.—In the House of Representatives, Mr. Jensen, Assistant Minister for Defence, has announced that it was the policy of the Government to replace as early as possible the submarines *AE. 1* and *AE. 2* that had been lost, and the Imperial Government had been advised to that effect.

Atlantic Transport Line.—The weekly passenger service of the Atlantic Transport Line, London to New York and New York to London, has been temporarily reduced to one steamer (the *Minneapolis*) every five weeks in consequence of the other seven passenger steamers of the line having been requisitioned for Government service.

New Inter-Island Shipping Service.—His Majesty's Chargé d'Affaires at Santo Domingo reports that the Danish East Asiatic Steamship Company has established a monthly service between St. Thomas (Danish West Indies) and the ports of Puerto Plata, Sanchez, San Pedro de Macoris, and Santo Domingo. This service runs in connection with the company's line from Copenhagen to St. Thomas.

Examination Regulations.—The amendments which have been made in the regulations relating to the examinations of masters, mates and engineers have been consolidated, and these, together with certain temporary modifications in the regulations brought about by the war, are embodied in a publication issued by the Board of Trade and sold for 1d. from Wyman & Sons, Ltd., Fetter Lane, London, E.C., and the usual channels.

Diesel Engines for the "Maumee."—One of the 2,560 h.p. Diesel engines is practically ready for a shop test at the New York navy yard. Two of this type of engine are being built for the *Maumee*, the fuel ship which is under construction at Mare Island, Cal. Although engines of this type are being used exclusively in submarines and smaller ships, the engines at the New York yard will be the largest of their type in the United States Navy.

Pacific Mail Steamship Company.—It is reported that the Pacific Mail Steamship Company, which is giving up business on account of the U.S.A. Seamens' Act, has sold five steamers to the Atlantic Transport Line of West Virginia. It is said that the following are four of the five ships which have changed hands: *Mongolia*, 13,639 tons; *Manchuria*, 13,639 tons; *Korea*, 11,276 tons; *Siberia*, 11,284 tons. All vessels are twin-screw and were built between 1901 and 1904.

Americans and the "Indian Prince."—Mr. Gerard, United States Ambassador in Berlin, has been instructed to protest against the decision of the German Prize Court which justified the sinking of the British steamer *Indian Prince*, carrying American-owned coffee, by the *Prinz Eitel Friedrich* in the South Atlantic, last winter. The State Department holds that the destruction of the vessel and cargo was a clear violation of the American-Prussian Treaty of 1828 and the principles of international law.

The "Emden."—The *Sydney Evening News* says that to salve the *Emden* as she lies on Cocos Island, the tender of E. G. Barnley, E. S. Felton, G. M. Richards, and C. H. Read has been accepted by the naval authorities. It is the intention of this syndicate to float a company, and commence operations as soon as possible. Their object is to bring the *Emden* to Sydney under her own steam. The Commonwealth will then have the option of purchasing the warship.

Merchant Vessels Commandeered by Italy.—Article I of a Royal decree provides that during the war compensation for requisitioning merchant vessels will be calculated on an approximate basis of under two-thirds of the current freight rates. Such compensations not to be less than the average of the freights paid during the half-year previous to January 26, for ships of similar type. The full translation of the decree may be consulted by United Kingdom firms interested at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Government Steel Requirements.—At a meeting of the English and Scottish Steelmakers' Associations, held in London at the end of the week, arrangements were provisionally made for the supplying of the Government's requirements of steel during the next 12 or 15 months. A committee has been formed to allot the contracts to the respective associations, which in turn will allocate the work among their members. In order to obviate undue inflation of prices, the committee will, in consultation with the Government, fix fair prices for the different classes of material.

Great Northern Pacific's Services.—In answer to rumours that the Great Northern Pacific steamships *Great Northern* and *Northern Pacific* would be removed from Flavel and operated out of Puget Sound, President L. C. Gilman has issued the following official statement:—"This company has no intention of abandoning the present route of the Great Northern Pacific Steamship Company steamers or changing their terminals. The business done by the steamships has proved highly satisfactory and there is no disposition or intention of making a change."

German Vessels Seized in the States.—Two German schooners, the *Neptun* and *Atlas*, interned in Oakland Harbour since the commencement of the European war, were seized on July 30 by the United States marshal, upon writs for $19,539 and $3,098, respectively, issued by the United States District Court. The vessels were owned by the Jaluit Gesellschaft, of Hamburg, Germany. The actions were commenced by Williams, Dimond & Co. to recover money they advanced for the crews' wages and for maintenance.

American-Hawaiian Company's New Vessels.—The first of the three new steamers now building for the American Hawaiian Steamship Company, at Sparrows Point, Md., is expected to be completed by December 15. She is named the *Floridan*, and measures 414 ft. in length, 53 ft. beam and 31 ft. depth. Two other boats are building for the same owners, the *Artisan* and *Arboreen* which will be especially equipped for handling lumber as well as general freight. According to present plans, the *Artisan* should be completed by March 1, 1916, and the *Arborean* by May 1, 1916. These vessels are 389 ft. in length, 54 ft. beam and 32 ft. depth.

Institute of Metals.—The following is a list of the papers that are expected to be submitted at the autumn meeting of the Institute of Metals to be held at the Chemical Society's Rooms, Burlington House, Piccadilly, W., on Friday, September 17, 1915, commencing at 8 p.m.:—(1) "The Corrosion of Gun-Metal," by Dr. C. H. Desch; (2) "Metallic Crystal Twinning by Direct Mechanical Strain," by Professor C. A. Edwards, D.Sc.; (3) "Notes on the Copper-Rich Kalchoids," by Professor Brinton and Professor S. L. Hoyt; (4) "The Constitution of Brasses containing Small Percentages of Tin—A Contribution to the Study of the Ternary System, Copper-Zinc-Tin," by Dr. O. F. Hudson and Mr. R. M. Jones, M.Sc.; (5) (*a*) "Structural Changes in Industrial Brasses" (*b*) "Hardness of Copper-Zinc Alloys," by Dr. D. Meneghini; (6) "Specifications for Alloys for High-Speed, Superheated Steam, Turbine Blading," by Mr. W. B. Parker; (7) "The Physical Properties of Metals as Functions of each Other," by Mr. A. H. Stuart, B.Sc.; (8) "Detection of Internal Blow-holes in Metal Castings by Means of X-Rays," by Mr. C. H. Tonamy; (9) "A Thermostat for Moderate and High Temperatures," by Messrs. J. L. Haughton, M.Sc., and D. Hanson, M.Sc.

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All advertisements should be addressed to—

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"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and type.	Tonnage.	Dimensions. Draught in ( ).	Sold by, to	Builders, hull and year.	Machinery and builders.	Remarks.
Corinthic, ss. ...	4,736 gr. 2,960 net.	385′ × 52′ × 27′	W. H. Cockerline & Co., Hull, to Liverpool buyers	Irvines S.B. & D.D. Co., W. Hartlepool (1914)	25½, 42, 7[illegible] × 48 (Richardsons, Westgarth & Co., Hartlepool)	Price about £85,000.
Dronning Olga, ss. (awning dk.)	2,568 gr. 1,621 net.	285¾′ × 43¼′ × 24½′	Dansk-Belgisk Dmpsk. (A. Christensen, Mgr.), Copenhagen, to Scandinavian buyers	Howaldtswerke, Kiel (1907)	20½, 33½, 55½ × 35½ (Howaldtswerke, Kiel)	Price about £40,000.
Drumgeith, ss. (spar dk.), renamed **Matra**	3,883 gr. 2,472 net. 6,200 d.w.	355′ × 48′ × 17⅜′	Village SS. Co. (R. A. & J. H. Mudie, Mgrs.), Dundee, to T. & J. Brocklebank, Liverpool	J. Priestman & Co., Sunderland (1905)	42, 68 × 48 (Wallsend Slipway Co., Newcastle)	—
Ennerdale, ss. (well dk.)	1,148 gr. 516 net.	230½′ × 33¾′ × 16′	Maoriland SS. Co. (C. McArthur, Mgr.), Wellington, to Union SS. Co., of New Zealand, Dunedin	Ailsa S.B. Co., Troon (1902)...	17, 28, 45 × 33 (Muir & Houston, Glasgow)	—
Libuse, ss. (spar dk.) (ex *Hornby Castle*), renamed **Warren**	3,712 gr. 2,359 net.	361′ × 46½′ × 17½′	A. Lederer, Trieste, acquired by Warren SS. Co., London	W. Pickersgill & Sons, Sunderland (1899)	24, 40, 67 × 45 (G. Clark, Sunderland)	Sold in May, 1914, for about £20,500.
Krete, ss. (well dk.), (ex *Phyllis*)	2,429 gr. 1,574 net.	290′ × 39′ × 18½′	P. Ambatielos & G. Carantinos, Cephlonia, to Copenhagen buyers	Ropner & Son, Stockton (1891)	19½, 36, 59½ × 39 (T. Richardson & Sons, Hartlepool)	—
Knarwater, ss. (well dk.)	1,659 gr. 998 net.	260½′ × 35′ × 18½′	Akties. John Christie (W. Holby, Mgr.), Christiania	Armstrong, Mitchell & Co., Newcastle (1883)	32, 60 × 39 (Blair & Co., Stockton)	
Manapouri, ss. (pt. shade dk.)	2,060 gr. 1,288 net.	285½′ × 36½′ × 23½′	Union SS. Co., of New Zealand, Dunedin, to buyers not stated	W. Denny & Bros., Dumbarton (1881)	20½, 30, 41, 60 × 48 (Denny & Co., Dumbarton)	—
Maritime, ss. (ex *Schlesien*), (spar dk.)	5,642 gr. 3,598 net.	421½′ × 55′ × 28⅝′	Maritime SS. Co. (W. Thomas, Sons, & Co.), London, to British buyers	Flensburger Schiffsb. Ges., Flensburg (1907)	24, 34, 51, 71 × 54 (Flensburger Schiffsb. Ges.)	Price about £100,000, sold by auction in January last for about £65,200.
Moldavia, ss. (ex *Dalarne*)	2,314 gr. 1,461 net. 345 d.w.	282′ × 42′ 6″ × 16′ 5″	Angf. Aktieb. Moldavia (A. A. Thore, Mgr.), Jonstorp, Sweden, to Plisson Steam Nav. Co., Paris and Cardiff	W. Gray & Co., Ltd., W. Hartlepool (1901)	21, 33, 56 × 36 (Central Marine Engineering Works, W. Hartlepool)	—
Oden, ss. (well dk.) (ex *Glenoran*, ex *Luscongadu*)	1,508 gr. 898 net.	250′ × 35′ × 15¼′	Rederiaktieb Oden (G. Stoberg), Malmo, to H. Haraldsen, Skien	A. Stephen & Sons, Glasgow (1887)	17½, 29, 46 × 39 (A. Stephen & Sons)	Price about £19,250.
Oriental, tss. (spar dk.)	5,284 gr. 3,085 net	41 ⅛′ × 48′ × 26′	P. & O. Line to Ho Hone S.S. Co., Singapore	Caird & Co., Greenock (1889)	38, 59½, 96 × 66 (Caird & Co.)	Price £32,000. Latterly on Shanghai-Japan route. Will now be used for South China trade.
Pukaki, ss.	1,444 gr. 917 net.	230′ × 36½′ × 17½′	Union SS. Co., of New Zealand, Dunedin, to British buyers	W. Denny & Bros., Dumbarton (1887)	16, 24, 32, 47 × 36 (Denny & Co., Dumbarton)	—
St. John, ss. (pt. awning dk.), (ex *H. D. Coutts*)	2,557 gr. 1,519 net.	306′ × 42′ × 18½′	Angf. Aktieb. St. George (Th. Willerding, Mgr.), Gothenburg, to Scandinavian buyers	Tyne Iron S.B. Co., Newcastle (1895)	23, 38, 62 × 42 (Wallsend Slipway Co., Newcastle)	—
Sakura Maru, ss.	3,204 gr. 1,730 net.	340½′ × 42½′ × 21½′	Imperial Marine Assn., Tokio, to Russian buyers	Mitsu Bishi Dockyard & Engine Works, Nagasaki (1908)	Turbines (Mitsu Bishi Dockyard & Engine Works)	Price about £60,000.
Sifnos, ss. (ex *Lycoglen*) (well dk.)	2,426 gr. 1,572 net.	295½′ × 40′ × 19½′	Cosmettos & Filicos, Piraeus, to buyers not stated	J. Readhead & Sons, S. Shields (1890)	23, 37½, 61½ × 39 J. Readhead & Sons)	Price about £28,000.
Steinbek, s.s. (ex *Dochridge*)	2,164 gr. 2,062 net.	276½′ × 42′ × 21¼′	Knohr & Burchard, Nfl., Hamburg, to American buyers	W. Hamilton & Co., Port Glasgow (1892)		Sold in December for about £1,[illegible].

SHIPPING SHARE MARKET.

[illegible]

[illegible] discounts [illegible] a substantial appreciation in capital during the next [illegible] years. A comparison between prices ruling now and those existing a year ago [illegible] that buying has already increased the price of many securities in the shipping section of the stock markets. Among these may be named British and African navigation debentures which are 5 points up on the price at July 30, and Humber Brothers' debentures 5 points up. There are, however, several other debentures which still stand at a discount and are worth investigation by all investors having surplus cash and requiring a higher income than that afforded by the War Loan. It is, of course, this point of fixed redemption that makes the War Loan so attractive an investment in comparison with our early investment issues, such as Consols. In the shipbuilding and iron and steel sections of the market a study of the lists on this page will disclose [illegible] instances where debentures in first-class undertakings paying [illegible] ordinary capital are to be secured at several points below the quotations of a year ago.

SHIPPING, SHIPBUILDING, ENGINEERING AND MARINE INSURANCE SHARE LIST.

SHIPPING AND DOCKS.

Name.	Shares and paid.	Extreme quotations, 1913.	Last ann. div. % or per share.	Yield. %	Quotation, July 30, 1914.	Cash price during week.
	£					
Ardrossan SS.	20	27½—19¼	7	7¼	18—20	—
Asiatic Line ... Def.	100	95—89	4	4½	83½—85½	—
Australian Line ... Cum. pref.	10	10½—10	5½	5½	10—10⅛	10⅛
Do. ... Deb.	Stk.	98½—98	4½	4½	104—106	104⅛
Argentine Nav. ... Cum. pref.	1	29/6—25/-	5	4¼	⅞—1⅛	—
Do. ... Def.	Bds.	104½—100	6	6	98—100	91½
Australasian Un. S. Nav. Def.	Stk.	84½—81½	4	4¼	80—83	—
Bartlett Steam ... "A"	10 (paid)	⅝—⅜	5	5	½—5½	—
British & American Nav. Def.	Stk.	102—101	4½	4½	99½—98½	103
British Isles Nav. Def.	Stk.	104—98½	4	4¼	99½—100	99½
Brocklebank SS. ... Cum. pref.	2	2⅝—1¾	—	—	—	—
Cairn Line ... Def.	Bds.	102—94	5	5¼	91—93	—
Clan Line ... Ord.	10	14⅜—9	15	14⅝	10⅜—11	13½
Coast Lines ... Ord.	£1	—	10	9	—	1
Cunard SS. ... Ord.	1	35/9—28/-	20	9	12⅛—13	2⅛
Do. ... Cum. pref.	Stk.	105—97⅜	5	5⅛	99—101	99½
Do. ... Deb.	Stk.	102⅜—99	4½	4½	101—103	99
Elder Line ... Def.	Stk.	103—100	4	4	98—102	99
Elder Dempster ... Cum. pref.	1	1½—⅞	5⅛	5⅛	1⅛—1⅛	—
Do. ... ... Deb.	Stk.	105—99⅜	5	5¼	102—104	89
Federation Lines ... Pref. Ord.	10	10⅜—1⅜	6½	6	10—10½	9⅛
Do. ... Cum. pref.	10	10⅜—1⅜	4½	4½	10—10½	9
Frames Forwarding ... Cum. pref.	5	97/6—92/6	5½	5½	4¾—5	4
Furness, Withy ... Ord.	1	44/3—29/6	10	8½	1⅛—1⅛	1⅛
Do. ... Cum. pref.	10	9⅜—9⅜	5	5⅛	9⅜—10	8½
Gen. Steam Nav. ... Ord.	7½	8½—8⅜	8	8	5⅞—6⅛	5⅞
Do. ... ... Pref.	8	7¼—7¼	8	8	7⅞—7⅞	7⅞
Hamburg Line ... Cum. pref.	5	85—85	Nil	Nil.	2⅜—2⅝	—
Do. ... Deb.	Stk.	84½—83	4½	5½	81—86	83
Hall Bros. ... Cum. pref.	5	4½—3	7½	—	4⅜—4⅝	4⅜
Do. ... Deb.	Stk.	85—78	4½	5	81—86	90
India, Glen Nav. & Rly. ... Ord.	10	9½—7⅛	—	—	9—10	—
Ivory Comm. Nav. ... Pref. Ord.	5	5⅜—87/6	6	5¾	3⅜—4⅛	3⅜
Irrawaddy Flotilla	40	125—114	15	12⅜	12⅝—12⅝	—
King Line ... ... Ord.	10	9½—8	8	7½	8½—9¼	10¼
Lancashire Shipping ... Deb.	Stk.	87—79	5	5¼	75—80	65
Lancashire & Holt ... Cum. pref.	£1	1⅛—⅝	6	6	½—1⅛	—
Leyland (F.) ... Cum. pref.	10	11—9⅜	10	12⅛	7⅞—8¼	7⅞
Do. ... ... Deb.	100	99½—95½	4	4	99—101	—
Mercantile SS. ... ... Ord.	5	8⅜—6⅜	17½	16⅝	6—6⅜	6⅛
Do. ... ... Pref.	1	18/—16/6	5	5⅛	¾—1	1⅛
Moss Line ... ... Ord.	10	14—11⅜	15	—	—	—
Nelson Steam Nav. ... Def.	100	103½—99	5	5⅛	99½—101½	97
New Zealand ... ... Ord.	8	9⅜—10⅜	8	8	14½—15½	15⅜
Do. ... ... Deb.	Stk.	97—92½	4	4⅛	92—94	88⅛
Nitrate Producers SS. ... Ord.	5	8⅜—8	12½	7½	8—8½	12½
Do. ... Cum. pref.	5	5—97/6	—	—	4⅞—5	—
Ocean Steam Nav. ... Deb.	100	100—99½	4½	4½	97—99	94
Orient Steam Nav. Co. ... Cum. pref.	10	10⅜—9⅞	5	5⅛	9⅜—10	9⅛
Do. ... ... Deb.	100	99—94½	4½	4¾	98—100	97½
P. & O. S. N. ... Cum pref.	100	125½—107	5	7½	109—112	96½
Do. ... ... Def.	100	35/—27/6	15	6	270—290	290
Do. ... ... Deb.	Stk.	91—83	3½	4¼	84—86	75
Prince Line	1	25/3—20/-	5	3½	1—1⅛	1⅛
R.M.S.P. ... ... Ord.	100	143—100½	Nil.	Nil.	82—87	74
Do. ... ... Pref.	Stk.	100⅞—96	5	5¼	98—101	87
Do. ... ... Deb.	Stk.	104½—100⅜	4½	4½	101—103	80
Shaw, Savill & Alb. ... Cum. pref.	5	5⅜—96/3	5	4¾	4¾—5	—
Shell Transport ... ... Ord.	1	5⅞—96/10½	30	5⅝	4—4⅛	4⅛
Do. ... Cum pref.	1	11⅞—10	5	4½	10¼—10½	9⅜
Sutherland SS. Co. ...	£1	1½—1	20	13⅜	1—1⅛	1⅛
Union Castle SS. ... Cum. pref.	10	10—9⅛	4½	5	8⅜—9⅛	8
Do. ... ... Deb.	Stk.	95⅜—92	4	4¼	93—95	87½
Union SS. of N. Z. ... Deb.	Stk.	95—91	—	—	—	—
West Hartlepool ... ... Pref.	10	4⅜—3⅛	Nil.	Nil.	2⅜—3½	7⅛

INSURANCE.

Alliance	20 (2·4 pd.)	12⅞—11⅜	12/-	6½	11⅜—12⅜	9½
Do. new shares	1	14⅜—12⅝	12/-	5½	13½—14½	10½
Indem. Mutual Marine	15 (3 pd.)	10⅛—9⅜	1·85	6	10—11	9
London Assurance	25 (12½ pd.)	54—49	20	5½	54—56	44½
Marine Insurance	25 (15 pd.)	38½—36½	45/-	6½	38⅝—39½	35½
Maritime Insurance	10 (2 pd.)	5⅞—4⅛	12½	—	8⅛—8⅜	—
Merchants' Marine Insurance ...	10 (2½ pd.)	66 3—61/3	7½	5	4—4⅛	3⅞
N. British & Mercantile ...	Ord. 25 (6½ pd.)	49⅜—48⅜	40/-	5½	40⅝—41½	51⅛
Do.	Pref. Stk.	100¾—95½	4	4¼	98—100	90½
Phœnix Assurance	10 (1 pd.)	7⅝—7	40	6	7⅛—8⅛	6⅛
Reliance Marine	10 (2 pd.)	7—6½	17½	4½	7⅛—7⅜	7⅛
Royal Exchange Assurance ...	Stk.	210—196½	10	5⅛	213—218	191
Sea Insurance	10 (2 pd.)	20—17½	8	4	20—21	20½
World Marine, Limited ...	5 (2 pd.)	25—23 1/2	5	5½	1⅝—1⅞	1⅞

* With arrears. † Includes 2½% bonus.

IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1913.	Last ann. div. % or per share.	Yield. %	Quotation, July 30, 1914.	Cash price during week.
	£					
Babcock & Wilcox ... ... Ord.	1	69 4½—56 3	16	5⅛	2⅜—2⅝	2⅜
Baldwins ... Cum. pref.	1	22/6—21/3	5⅛	5⅛	1⅛—1⅛	1⅛
Do. ... ... Deb.	Stk.	100⅜—100¼	4½	4½	97—99	99
Bayliss, Jones ... Cum. pref.	1	—	5	7½	⅜—⅝	⅝
Bell Bros. ... Cum pref.	10	12¼—11	6	5⅛	11⅜—12½	10⅞
Do. ... ... Deb.	Stk.	98—96¾	4	4⅛	96 98	96—98
Bessemer (Henry) ... Ord.	1	1⅛—1⅛	10	8⅜	1⅛—1⅛	1⅛
Bolckow Vaughan ... Ord.	1	22/6—19/4½	6	6½	1⅛—1⅛	1⅛
Do. ... ... Cum. pref.	20	21½—20 -	5	5½	20—21	19½
Cargo Fleet Iron ... ... Ord.	1	11 10½—7/6	2½	5	½—⅝	⅝
Do. ... ... Deb.	100	91—85½	4½	5½	89—92	88½
Consett Iron Co. ... ... Ord.	1	88/6—74/6	30	7½	3¼—3½	2½
Dominion Iron & Steel	Bds.	100½—88½	5	6½	83—87	77½
Dorman, Long ... ... Ord.	1	21 6—16 9	7½	8½	17/—19/-	17/-
Do. ... ... Deb.	Stk.	88½—85⅛	4	4½	87—90	84½
Ebbw Vale Steel & Iron Ord.	1	18/—16/-	10	10½	3/—3/7	—
Guest, Keen & Nettlefds Ord.	1	68/9—61/3	15	5	3⅜—3⅝	3⅜
Do. ... ... Cum. pref.	5	5⅛—5⅛	5	4½	5⅜—5⅝	5⅛
Do. ... ... Deb.	Stk.	100⅜—95⅞	4	4½	96—98	82½
Hadfield's Steel Foundry Ord.	1	63 —58 9	22½	7⅛	3—3⅛	3⅛
Hawthorn (R & W.) Leslie Ord.	10	13—12	10	7½	13⅜—13⅝	15½ 14
Ibbotson Bros.	5 (4 pd.)	7—5¾	10	7⅛	6—6⅛	6—6⅛
Jessop (W.) & Sons ... Ord.	5 (4 pd.)	6⅞—6⅝	15	11⅜	6½—6⅝	6½
Lanarkshire Steel Cum. pref.	10	7⅛—6⅞	5	6⅞	5½—6⅜	6
Lysaght (J.) ... Cum. pref.	1	27/6—25/-	8	5	1⅛—1⅜	1⅛
Do. ... ... Deb.	Stk.	108⅜—102⅜	4½	—	104—106	—
Manganese Bronze ... Ord.	1	⅜—⅜	6	11	½—⅜	⅜
Do. ... ... Cum. pref.	1	⅜—⅜	6	6½	¼—1	¼
North Eastern Steel ... Deb.	Stk.	89—92	4½	—	—	—
Palmers Shipb & Iron "A"	1	⅛—⅛	Nil.	Nil.	⅛—⅜	—
Scott (Walter) ... ... Ord.	1	16 —14/6	5	6½	2—3	3
Do. ... ... Deb.	Stk.	86—82	4	4½	81—82	80—91
Sheffield Forge ... ... Ord.	1	1⅜ 1⅜	12½	7	1⅛—1⅜	1⅛
Shelton Iron & Steel ... Deb.	100	99⅞—90	5	5½	93—98xd	94½
S. Durham Steel & Iron Ord.	1	35/—23/6	10	6½	1⅜—1⅝	1⅝
Do. ... ... Cum. pref.	1	20/6—19/-	6	5⅛	1½—1⅝	1⅝
Do. ... ... Deb.	Stk.	95—98	4½	4½	90—92	90—92
Steel Co. of Scotland ... Ord.	10	12⅜—8⅜	5	5⅜	8⅝—9	8¾ 9
Stewarts & Lloyds Pref. ord.	10	21⅛—20	10	5⅛	20—21	19½
Do. ... ... Cum. pref.	10	14⅛—13½	6	4⅜	11⅜ 13⅞	13⅛
Stone (J.) ... ... Cum. pref.	10	9⅜—9	5	5⅛	8¾—9¼xd	9
United States Steel ... Ord.	100$	71⅜—50	3	3⅜	61—61½	77½
Do. ... ... Cum. pref.	100$	113⅜—104½	7	6⅜	112—113	113
Vickers Ltd. ... ... Ord.	1	43/6—33 3	12½	7⅞	1¼—1⅜	1⅛
Do. ... ... Pref.	Stk.	106½—99	5	5⅛	104—107	100
Do. ... ... Deb.	Stk.	100⅜—91½	4	5⅛	96½—98½	79
Weardale Steel ... Def. ord.	1	21/—17/-	6	7½	⅜—⅛	—
Do. ... ... Cum. pref.	1	20 1⅜—18 -	6	6⅜	⅝—1	1
Do. ... ... Deb.	Stk.	77—73½	4	—	77—80	—
Workington Iron & Steel Ord.	1	16/6—12 3	6	8½	⅝—¾	¾

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth ... Ord.	1	60 —39/	12½	6	1⅜—2⅛	1⅝
Do. ... ... Cum. pref.	5	95 —84/6	4	5⅛	4⅛—4⅜	3⅝
Do. ... ... Deb.	Stk.	98½—91⅜	5	5⅛	96—98	89½
Beardmore (W.) ... ... Deb.	100	96¼—91½	4½	5⅛	94—96	84½
Brown (John) ... ... Ord.	1 (15s. pd.)	23 —17 9	12½	9⅜	2⅝—3⅛xd	1⅞
Do. ... ... Cum. pref.	10	10⅜—9⅛	5	5⅛	9½—10xd	9
Cammell Laird ... ... Ord.	5	3⅜—2⅞	7½	8	3⅜—4⅛	3
Do. ... ... Cum. pref.	5	92/6—79/-	5	6	4⅛—4⅜	4⅛
Do. ... ... Deb.	100	90⅜—84⅛	4½	5⅜	92—94	89
Dunlop (Jas.) ... ... Ord.	1	18/6—17/6	Nil.	—	⅜—⅝	⅜
Do. ... ... Cum. pref.	1	1⅜—⅞	6	7½	¾—1	¾
Fairfield Shipbldg Cum. pref.	10	10—7⅝	6	8⅛	—	7½
Fleming & Ferguson ... Ord.	10	20½—12½	10	6½	14½—14⅝	15
Gray (Wm.) ... ... Deb.	100	100⅜—100	4½	4½	100-102	100
Henderson (D. & W.) Cum. pref.	1	⅝—⅜	5	12	⅜—⅝	⅜
Richardsons Westgarth Ord.	1	3/6—1/9	Nil.	Nil.	⅛—⅜	⅛
Do. ... ... Cum. pref.	1	9 9—4 3	Nil.	Nil.	⅛—¼	⅛
Do. ... ... Deb.	Stk.	70—58	4½	6½	55—58	65½
Simons (W.) ... Cum. pref.	10	10⅜—10	5	4⅝	10½—10⅝	10½
Stephenson (R.) ... ... Ord.	1	6⅝—5⅜	Nil.	Nil.	—	—
Do. ... ... Deb.	Stk.	6⅝—6⅜	Nil.	Nil.	—	—
Swan, Hunter & W. R. ... Ord.	1	19 10½-16 -	†10	10⅛	1⅛—1	1⅛
Do. ... ... Cum. pref.	1	19/9—17/9	5	5⅛	⅞—1	⅞
Do. ... ... Deb.	Stk.	90⅜—88	4¼	—	90—93	—
Thornycroft (John I.) ... Ord.	1	27 6—12 6	8	8	⅝—⅞	⅞
Do. ... ... Cum. pref	1	19/3—11/3	6	7⅝	⅞—1	1
Do. ... ... Deb.	100	94—91	5	5⅛	88—92	94
Wallsend Slipway ... ... Ord.	1	1⅜—1⅛	10	—	1⅛—1½	—
Do. ... ... Cum. pref.	1	20/—20/-	5	—	1⅛—1⅜	—

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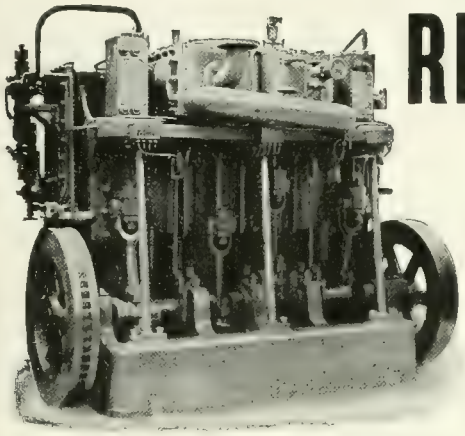

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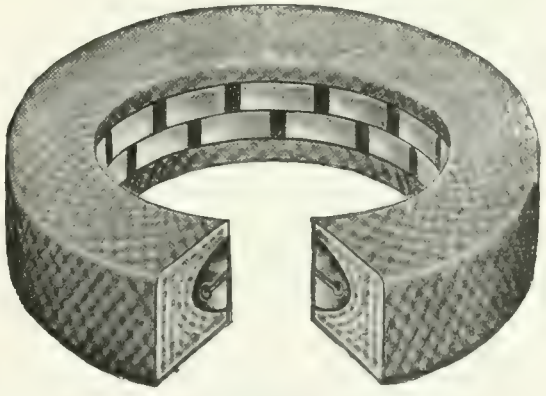

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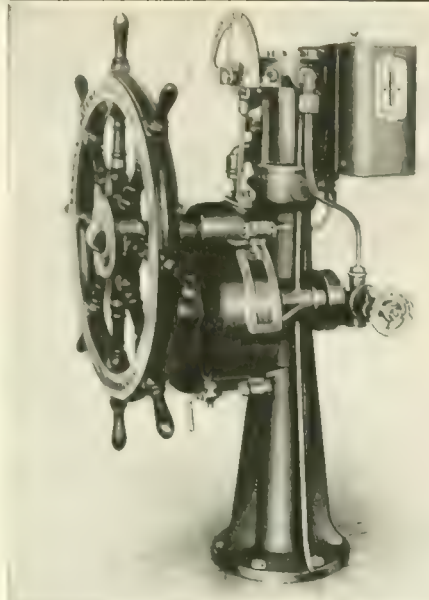

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Heinke, C. E., & Co., 88, 89, Grange Road, Bermondsey, S.E.

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Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford.
Belliss & Morcom, Ltd., Birmingham.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Contraflo Condenser & Kinetic Air Pump Co., Ltd., 3, Central Buildings, Westminster, S.W.
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Heinke, C. E., & Co., 88, 89, Grange Road, Bermondsey, London, S.E.
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ALUMINIUM PAINT—
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Spencer, John, & Sons, Ltd., Steel Works, Newburn-
Sykes, Richard, & Son, Ltd., Cradley Heath.
Taylor, Samuel, & Sons (Brierley Hill), Ltd., Brierley Hill, Staffs.
Wright, Joseph, & Co., Ltd., Tipton, Staffs.

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Holzapfels, Ltd., Newcastle-on-Tyne.
Milburn, A., & Co., Sunderland.
Wailes Dove Bitumastic Ltd., 5, St. Nicholas Buildings, Newcastle-on-Tyne.
Websters Ltd., Hull.

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Holzapfels, Ltd., Newcastle-on-Tyne.
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Websters Ltd., Hull.

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Billington & Newton, Ltd., Longport, Staffs.
Bowran, Robt., & Co., Ltd., Newcastle-on-Tyne.
Delta Metal Co., Ltd., East Greenwich.
McConnell, A., & Co., Ltd., 60, Drury Buildings, Water St., Liverpool.

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Brown, John, & Co., Ltd., Atlas Works, Sheffield.

ASBESTOS FITTINGS—
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

ASBESTOS GOODS—
Beldam Packing & Rubber Co., Ltd., 1 and 2, Gracechurch Street, London, E.C.
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.
Walker, Jas., & Co., 11, Bishop Court, Anderston, Glasgow.

ASH BAGS—
Speedings Ltd., Sail Works, Sunderland.

ASH BINS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

ASH DISCHARGING APPLIANCES—
Mactaggart, Scott & Co., Ld., Loanhead, Edinburgh

AWNINGS—
Trewent & Proctor, F. J., Ltd., 43, Billiter Buildings, E.C.
Speedings Ltd., Sail Works, Sunderland.

BARROWS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

BARROWS (Cargo)—
Edina Manufacturing Co., 19b, Broad Wynd, Leith.

BEDDING & NAPERY—
Stewart, Archibald & Co., 40-48, Union Street, [Glasgow.

BEMAL CONDENSER TUBES—
The Yorkshire Copper Works, Ltd., Leeds.

"BITUMASTIC" ENAMEL MANUFACTURERS—
Wailes Dove Bitumastic Ltd., 5, St. Nicholas Buildings, Newcastle-on-Tyne.

BLINDS—
Laycock, W. S., Ltd., Victoria Works, Millhouses, Sheffield.

BLOCKS—
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Higginson & Co., 7, Hurst Street, Liverpool.

BLOWERS—
Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. [Belfast.
Davidson & Co., Ltd., Sirocco Engineering Works,
Keith, James, & Blackman Co., Ltd., 27, Farringdon Avenue, London, E.C.

BOATS—
Crichton, J., & Co., Saltney Shipyard, Chester.
Leitch, John, & Co., The Ferry, Renfrew, Scotland.

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Elliot & Jeffery, East Dock, Cardiff.
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Hawthorne, R. & W., Leslie & Co., Ltd., St. Peter's, Newcastle-on-Tyne.
Howden, James, & Co., Ltd., Scotland St., Glasgow.
Perman & Co., Ltd., 82-83, Fenchurch Street, E.C.
Wallsend Slipway & Engineering Co., Ltd., Wallsend-on-Tyne.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

BOILER CIRCULATORS—
Beresford Eng'n'ring Co., Beresford Lane, Cardiff.

BOILER CLEANER—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.

BOILER COMPOSITION—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.

BOILER COVERING—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.
Walker, Jas., & Co., 11, Bishop Court, Anderston, Glasgow.

BOILER MOUNTINGS—
Cockburns Ltd., Cardonald, Nr Glasgow.
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Royles Ltd., Irlam, Nr. Manchester.

BOILER PLATES (Steel)—
Leeds Forge Co., Ltd., Leeds.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.

BOILER PRESERVATIVE—
Atlas Preservative Co., Ltd., Deptford, S.E.

BOILER TUBES—
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BOLTS AND NUTS—
Coventry Chain Co., Ltd., Coventry.

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Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.
Greenwood & Batley, Ltd., Albion Works, Leeds.

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BRASS FOUNDERS—
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Chambers, John, Ltd., Lowestoft.
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Rennie & Co., North Greenhill Road, Paisley.

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Bowran, Robt., & Co., Ltd., 4, St. Nicholas Buildings, Newcastle-on-Tyne.
Callender's Cable & Construction Co., Ltd., Belvedere, Kent.
Delta Metal Co., Ld., E. Greenwich, London, S.E.
Stone, J., & Co., Ltd., Deptford, London, S.E.

BRIGHT STEEL—
Stonehouse Works Co., Ltd., Houghton Street, West Bromwich.

BUCKETS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

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CORRUGATED IRON—
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British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester. [on-Tyne.
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Sunderland Forge & Engineering Co., Ltd., Sunderland.

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Mather & Platt, Ltd., Manchester.
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ELECTRICAL CONTRACTORS—
Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.
Low, Archibald, & Sons, Ltd., 78, Merkland Street, Partick, Glasgow. [Glasgow.
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Chadburn's (Ship) Telegraph Co., Ltd., Cyprus Road, Bootle, Lancs.
Graham, Alfred, St. Andrew's Works, Crofton Park Road, S.E.
Holmes, J. H., & Co., Portland Road, Newcastle-
Mather & Platt, Ltd., Manchester. [on-Tyne.
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.
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British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester. [on Tyne.
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British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester. [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.

ELECTRICAL INSTRUMENTS (Relays)—
British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester. [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.

ELECTRICAL INSTRUMENTS (Voltmeters)—
British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester. [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-

EMERY WHEELS—
Sterne, L., & Co., Ltd., Crown Iron Works, Glasgow

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Wailes Dove Bitumastic Ltd., 5, St. Nicholas Buildings, Newcastle-on-Tyne.
Websters Ltd., Hull.

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Greenwood & Batley, Ltd., Albion Works, Leeds.

ENGINES (Land)—
Chambers, John, Ltd., Lowestoft.

ENGINES (Marine)—
Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford.
Central Marine Engine Works, West Hartlepool.
Chambers, John, Ltd., Lowestoft.
Hawthorne, R. & W., Leslie & Co., Ltd., St. Peter's, Newcastle-on-Tyne.
Howden, James, & Co., Ltd., Scotland St., Glasgow.
Perman & Co., Ltd., 82-83, Fenchurch Street, E.C.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

ENGINE & DECK STORES—
McGeoch, Wm., & Co., Ltd., 28, West Campbell Street, Glasgow.
Metallic Valve Co., Colonial House, Water Street, Liverpool.

ENGINE AUXILIARIES—
Aspinall's Patent Governor Co., 7, Strand Street, Liverpool.

ENGINE FITTINGS—
Aspinall's Patent Governor Co., 7, Strand Street, Liverpool.
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

ENGINE-ROOM OUTFITS—
Grieve, T., & Sons, Bedford Street, North Shields.
Newalls Insulation Co., 31, Mosley Street, Newcastle-on-Tyne.

ENGRAVERS—
Brown, Robert, & Co., 12, Espedair St., Paisley.

EVAPORATORS—
Central Marine Engine Works, West Hartlepool.
Royles Ltd., Irlam, Nr. Manchester.
Weir, G. & J., Ltd., Cathcart, Glasgow.

EXTRUDED METALS (Brass, Bronze, Copper, Delta Metals)—
Delta Metal Co., Ltd., E. Greenwich, London, S.E.

FANS—
Adam, J. M., & Co., Greenfield Iron Works, Dalmarnock, Glasgow.
Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford.
Boothroyd, H. T., Ltd., Bootle, Liverpool.
British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester. [Belfast.
Davidson & Co., Ltd., Sirocco Engineering Works,
Hogan & Wardrop, 2, Gresham Buildings, Basinghall Street, London, E.C.
Keith, James, & Blackman Co., Ltd., 27, Farringdon Avenue, London, E.C.

FEED-WATER HEATERS—
Beresford Engineering Co., Beresford Lane, Cardiff.
Central Marine Engine Works, West Hartlepool.
Contraflo Condenser & Kinetic Air Pump Co., Ltd., 3, Central Buildings, Westminster, S.W
Royles Ltd., Irlam, Nr. Manchester.
Weir, G. & J., Ltd., Cathcart, Glasgow.

FILES—
Brown, John, & Co., Atlas Works, Sheffield.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

FILTERS (Marine)—
Central Marine Engine Works, West Hartlepool.
Chambers, John, Ltd., Lowestoft.
Cockburns Ltd., Cardonald, Nr. Glasgow.
Mather & Platt, Ltd., Manchester.

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FIRE EXTINGUISHERS—
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FIRE-FIGHTING APPLIANCES—
Mining Engineering Co., Ltd., Meco Works, Sheffield.

FLAGS—
Riley, Edward, & Co., Leeds.
Speedings, Ltd., Sail Works, Sunderland.

FLOATING DOCKS—
Chalmers, Wm., & Co., Ltd., Rutherglen, Nr. Glasgow. [Scotland.
Hamilton, Wm., & Co., Ltd., Port Glasgow,
Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne.

FLOOR COVERING—
Docker Bros., Ltd., Metropolitan Road, Saltley, Birmingham.

FORCED DRAUGHT—
Adam, J. M., & Co., Greenfield Iron Works, Dalmarnock, Glasgow. [Belfast.
Davidson & Co., Ltd., Sirocco Engineering Works,
Howden, J. & Co., Ltd., Scotland Street, Glasgow.
Keith, James, & Blackman Co., Ltd., 27, Farringdon Avenue, London, E.C.

FORGING PRESSES—
Berry, Henry, & Co., Ltd., Croydon Works, Leeds.
Mactaggart, Scott & Co., Ltd., Loanhead, Edinburgh.

FORGINGS—
Brown, John, & Co., Ltd., Atlas Works, Sheffield.
Darlington Forge Co., Ltd., Darlington.
Hingley & Sons, Ltd., Netherton Iron Works, Staffs.
Sunderland Forge & Engineering Co., Ltd., Sunderland.

FORGINGS (Bronze)—
Delta Metal Co., Delta Works, East Greenwich, London, S.E.

FORGINGS (Steel)—
Brown, John, & Co., Ltd., Atlas Works, Sheffield.
Darlington Forge Co., Ltd., Darlington.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

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Low, Archibald, & Sons, Ltd., 78, Merkland Street, Partick, Glasgow.

FURNACE BRIDGES—
Hamilton, A., & Sons, 13, Bute Crescent, Docks, Cardiff.
McConnell, A., & Co., Ltd., 60, Drury Buildings, Water Street, Liverpool.

FURNACES—
Brown, John, & Co., Ltd., Atlas Works, Sheffield.
Deighton's Patent Flue & Tube Co., Ltd., Vulcan Works, Pepper Road, Leeds.
Leeds Forge Co., Ltd., Leeds.
Piggott, T., & Co., Ltd., Birmingham.

FUSES—
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.

GALLEY GEAR—
Grieve, T., & Sons, Bedford Street, North Shields.

GALVANIZERS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

GAS ENGINES—
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Mather & Platt, Ltd., Manchester.

GAUGES—
Chatwin, Thos., Ltd., Gt. Tindal St., Birmingham.

GEAR CUTTING—
Campbells & Hunter, Ltd., Dolphin Foundry, Leeds

GEARING—
Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.

GEARS—
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

GEARS (Noiseless or Silent)—
British Thomson-Houston Co., Ltd., Rugby.
Brown, David, & Sons (Hfd.), Ltd., Huddersfield.

GOVERNORS—
Aspinall's Patent Governor Co., 7, Strand Street, Liverpool.

GRINDING MACHINES—
Greenwood & Batley, Ltd., Albion Works, Leeds.

GRINDING WHEEL MACHINES—
Sterne, L., & Co., Ltd., Crown Iron Works, Glasgow

HATCH COVERS (Patent)—
Hogg-Carr Construction Co., Ltd., Newcastle-on-Tyne.

HEATING APPARATUS—
Ashwell & Nesbit, Ltd., Barkby Lane, Leicester.
Royles Ltd., Irlam, Nr. Manchester.
Saunders & Taylor, Ltd., 43, Lower Mosley Street, Manchester.

HEATING ENGINEERS—
Ashwell & Nesbit, Ltd., Barkby Lane, Leicester.
Low, Archibald, & Sons, Ltd., 78, Merkland Street, Partick, Glasgow.
Royles Ltd., Irlam, Nr. Manchester.
Saunders & Taylor, Ltd. 43, Lower Mosley Street, Manchester.

HELM SIGNAL TELEMOTORS—
Mactaggart, Scott & Co., Ld., Loanhead, Edinburgh

HIGH SPEED DRILLS—
Brown, John, & Co., Atlas Works, Sheffield.

HIGH SPEED STEEL—
Brown, John, & Co., Atlas Works Sheffield.

HOISTS—
Mather & Platt, Ltd., Manchester.
Stothert & Pitt, Ltd., Bath.
Waygood-Otis, Ltd., Falmouth Road, S.E.

BUYERS' GUIDE—*continued.*

HOSE—
Heinke, C. E., & Co., 88, 89, Grange Road, Bermondsey, London, S.E.

HYDRAULIC CRANES—
Berry, Henry, & Co., Ltd., Croydon Works, Leeds.
Brown Brothers & Co., Ltd., Rosebank Iron Works, Edinburgh.
Mactaggart, Scott & Co., Ld., Loanhead, Edinburgh

HYDRAULIC MACHINERY—
Armstrong, Sir W. G., Whitworth & Co., Ltd., Elswick Works, Newcastle-upon-Tyne.
Berry, Henry, & Co., Ltd., Croydon Works, Leeds.
Waygood-Otis, Ltd., Falmouth Road, S.E.

HYDRANTS—
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

INDIARUBBER—
Heinke, C. E., & Co., 88, 89, Grange Road, Bermondsey, London, S.E

INDICATORS—
Robinson, A., & Co., Ltd., Bootle, Liverpool.

INDUCED DRAUGHT—
Davidson & Co., Ld., Sirocco Eng'n'g W'rks, Belfast
Keith, James, & Blackman Co., Ltd., 27, Farringdon Avenue, London, E.C.

INSULATIONS—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W. [Liverpool.
Liverpool Refrigeration Co., Ltd., Colonial House,

IRON ROOFS AND BUILDINGS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

JOINTING MATERIAL (Manganesite)—
Hudson & Co.'s Successors, John, 15, Victoria Warehouses, Mansell Street, E.C.

LAMPS AND LIGHTS—
Grieve, T., & Sons, Bedford Street, North Shields.
Kaye, Joseph, & Sons, Ltd., Leeds.

LAUNCHES—
Chambers, John, Ltd., Lowestoft.
Crichton, J., & Co., Saltney Shipyard, Chester.
Leitch, John, & Co., The Ferry, Renfrew, Scotland.
Livingstone & Cooper, Ltd., Hessle, Hull.
MacLaren Bros., Ltd., Dumbarton.
Perman & Co. Ltd., 82-83, Fenchurch St., E.C.
Seamless Steel Boat Co., Ltd., Wakefield.
Thornycroft, John I., & Co., Ltd., Caxton House, Westminster, London, S.W.
Watson, J. S., Gainsborough.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

LAUNDRY MACHINERY—
Bradford, T., & Co., Salford, Manchester.

LAVATORY FITTINGS AND APPLIANCES—
Levick, John, Alma Street, Aston, Birmingham.

LEAD (Sheets and Pipes)—
Rimer Bros., Newcastle-on-Tyne.

LEAD (White and Red)—
Rimer Bros., Newcastle-on-Tyne.

LIFEBELTS AND BUOYS—
Speedings Ltd., Sail Works, Sunderland.

LIFTS (Window)—
Laycock, W. S., Ltd., Victoria Works, Millhouses, Sheffield.

LIFTS AND HOISTS—
Mactaggart, Scott & Co., Ld., Loanhead, Edinburgh
Waygood-Otis, Ltd., Falmouth Road, S.E.

LIGHTERAGE—
Alexander, W. H. J., St. John's Wharf, Wapping, E.

LIGHTERS—
Chalmers, Wm., & Co., Ltd., Rutherglen, Nr. Glasgow.
Crichton, J., & Co., Saltney Shipyard, Chester.
Watson, J. S., Gainsborough.

LIMEWASHING & DISINFECTING MACHINES—
Stonehouse Works Co., Ltd., Houghton Street, West Bromwich.

LOCKS—
Kaye, Joseph, & Sons, Ltd., Leeds.

LOCOMOTIVE TUBES (Copper & Brass)—
The Yorkshire Copper Works, Ltd., Leeds.

LUBRICATORS— [Cranstonhill, Glasgow.
McRobie, John, & Sons, 94, Elliott Street,

MACHINE TOOLS—
Campbells & Hunter, Ld., Dolphin Foundry, Leeds.
Greenwood & Batley, Ltd., Albion Works, Leeds.
Scriven & Co., Leeds Old Foundry, Leeds.

MACHINERY NAME PLATES—
Brown, Robert, & Co., 12, Espedair St., Paisley.

MAGNESIA—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.

MARINE ENGINEERS—
Bailey, C. H., Newport, Mon. Barry Docks.
Barry Graving Dock & Engineering Co., Ltd., Brown, John, & Co., Ltd., Clydebank, Nr. Glasgow.
Chambers, John, Ltd., Lowestoft.
Crichton, C. & H., Ltd., Huskisson Engine Works, Liverpool. [Southampton.
Day, Summers & Co., Ltd., Northam Ironworks,
Delegación de la Compañia Trasatlantica, Cadiz.
Diamond, Thos., & Co., Cardiff.
Doxford, Wm., & Sons, Ltd., Sunderland.
Elliot & Jeffery, East Dock, Cardiff.
Gray, Wm., & Co., Ltd., West Hartlepool.
Harland & Wolff, Ltd., Belfast.
Harris Bros., Ltd., Cambrian Dry Docks, Swansea.
Hawthorne, R. & W., Leslie & Co., Ltd., Hebburn-on-Tyne.
Hill's Dry Docks & Engineering Co., Ltd., Cardiff.

MARINE ENGINEERS *(contd).*—
Isherwood, J. W., 4, Lloyd's Avenue, London, E.C.
Livingstone & Cooper, Ltd., Hessle, Hull.
Mountstuart Dry Docks, Ltd., Cardiff.
Perman & Co., Ltd., 82-83, Fenchurch St., E.C.
Shearman, John, & Co., Ltd., Cardiff.
Simons, Wm., & Co., Ltd., Renfrew, Nr. Scotland.
Stephen, Alex., & Sons, Ltd., Linthouse, Govan, Glasgow.
Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne. [Westminster, S.W.
Thornycroft, John I., & Co., Ltd., Caxton House,
Wallsend Slipway & Engineering Co., Ltd., Wallsend-on-Tyne.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.
Workman Clark & Co., Ltd., Belfast.
Yarrow & Co., Ltd., Glasgow.

MARINE GOVERNORS—
Aspinall's Patent Governor Co., 7, Strand Street,

MARKING-OFF TABLES— Liverpool
Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.

MATTRESSES—
Stewart, Archibald, & Co., 40-48, Union St., Glasgow

METALLIC PACKING—
Beldam Packing & Rubber Co., Ltd., 1 and 2, Gracechurch Street, London, E.C.
McConnell, A., & Co., Ltd., 60, Drury Buildings, Water Street, Liverpool.
United States Metallic Packing Co., Ltd., Bradford

METAL SPINNINGS—
Levick, John, Alma Street, Aston, Birmingham.

METALS (Patent)—
Bowran, Robt., & Co., Ltd., Newcastle-on-Tyne.
Delta Metal Co., Ltd., Delta Works, East Greenwich.

MOTOR BOATS—
Chambers, John, Ltd., Lowestoft.
Crichton, J., & Co., Saltney Shipyard, Chester.
Leitch, John, & Co., The Ferry, Renfrew, Scotland.
Livingstone & Cooper, Ltd., Hessle, Hull.
Perman & Co., Ltd., 82-83, Fenchurch St., E.C.
Seamless Steel Boat Co., Ltd., Wakefield.
Thornycroft, John I., & Co., Ltd., Caxton House, Westminster, London, S.W.
White, J. Samuel, & Co., Ltd, East Cowes, I.W.

MOTOR STARTING AND CONTROL GEAR— [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.

NAVAL ARCHITECTS' SUPPLIES—
Walker, Jas., & Co., 11, Bishop Court, Anderston, Glasgow.

OIL CANS—
Kaye, Joseph, & Sons, Ltd., Leeds.

OIL ECONOMISERS—
Kaye, Joseph, & Sons, Ltd., Leeds.

OIL ENGINES—
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Edina Manufacturing Co., 19b, Broad Wynd, Leith.
Perman & Co., Ltd., 82-83, Fenchurch Street, E.C.
Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne.
Thornycroft, John I., & Co., Ltd., Caxton House, Westminster, S.W.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

OIL-FUEL INSTALLATION—
Wallsend Slipway & Engineering Co., Ltd., Wallsend-on-Tyne.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

OIL IMPORTERS & BLENDERS—
Rimer Bros., Newcastle-on-Tyne.

PACKING (Engine)—
Beldam Packing & Rubber Co., Ltd., 1 and 2, Gracechurch Street, London, E.C.
Walker, Jas. & Co., Ltd., Lion Works, Garford Street, West India Dock Road, E.

PAINTS—
Briggs, W., & Sons, Ltd., Dundee.
Cocks, Harry, & Co., Cardiff.
Hamilton, Archd., & Co., Possilpark, Glasgow.
Hoyle, Robson, Barnett, & Co., Ltd., St. Nicholas Chambers, Newcastle-on-Tyne.
Wailes Dove Bitumastic Ltd., 5, St. Nicholas Buildings, Newcastle-on-Tyne.
Websters Ltd., Hull.

PANELLING—
Stewart, Archibald, & Co., 40-48, Union St., Glasgow

PATENT HAWSE PIPE AND DECK FLANGE—
Hamilton, A., & Sons, 13, Bute Crescent, Docks, Cardiff.

PERFORATED METALS—
Braby F., & Co., Ltd., Eclipse Works, Glasgow.
Piggott, T., & Co., Ltd., Birmingham.

PIPES—
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.
The Yorkshire Copper Works, Ltd., Leeds.

PLANING MACHINES for Plate Edges—
Scriven & Co., Leeds Old Foundry, Leeds.

PLATE BENDING ROLLS—
Scriven & Co., Leeds Old Foundry, Leeds.

PORCELAIN ENAMELLED CAST IRON—
Levick, John, Alma Street, Aston, Birmingham.

PROPELLERS—
Billington & Newton, Ltd., Longport, Staffs.
Chambers, John, Ltd., Lowestoft. [Liverpool,
Crichton, C. & H., Ltd., Huskisson Engine Works.
Darlington Forge Co., Ltd., Darlington.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

PROPELLER BLADES—
Billington & Newton, Ltd., Longport, Staffs.
Darlington Forge Co., Ltd., Darlington.
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.

PUBLICATIONS—
"Shipbuilding and Shipping Record," Queen Anne's Chambers, Westminster, London, S.W.

PULLEY BLOCKS—
Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.
Higginson & Co., 7, Hurst Street, Liverpool.
Loveridge, Ltd., Cardiff.
Wright, Joseph, & Co., Ltd., Tipton, Staffs.

PUMPING ENGINES—
Central Marine Engine Works, West Hartlepool.

PUMPS— [ing Works, Bedford.
Allen, W. H., Son & Co., Ltd., Queen's Engineer-
Beresford Eng'n'ring Co., Beresford Lane, Cardiff.
Berry, Henry, & Co., Ltd., Croydon Works, Leeds.
Davey & Co. (London). Ltd., 88, West India Dock Road, E.
Dawson & Downie, Elgin Works, Clydebank.
Edina Manufacturing Co., 19b, Broad Wynd, Leith.
Hall, J. P., & Sons, Ltd., Peterborough.
Mather & Platt, Ltd., Manchester.
Weir, G. & J., Ltd., Cathcart, Glasgow.

PUNCHING AND SHEARING MACHINES—
Scriven & Co., Leeds Old Foundry, Leeds.

RADIATORS—
British Thomson-Houston Co., Ltd., Rugby.
Low, Archibald, & Sons, Ltd., 78, Merkland Street, Partick, Glasgow.
Royles Ltd., Irlam, Nr. Manchester.

RADIATOR TUBES—
The Yorkshire Copper Works, Ltd., Leeds.

REAMERS—
Chatwin, Thos., Ltd., Gt. Tindal St., Birmingham.

REFRIGERATING MACHINERY—
Hall, J. & E., Ltd., Dartford Ironworks, Kent.
Liverpool Refrigeration Co., Ltd., Colonial House, Liverpool.
Sterne, L. & Co., Ltd., Crown Iron Works, Glasgow

RESCUE APPLIANCES—
Mining Engineering Co., Ltd., Meco Works, Moorfields, Sheffield.

REVERSING ENGINES (Direct-Acting Type)— [Works, Edinburgh.
Brown Brothers & Co., Ltd., Rosebank Iron
Mactaggart, Scott & Co., Ld., Loanhead, Edinburgh

RHEOSTATS & RESISTANCES (all kinds)—
British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester. [on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.

ROPE-CUTTING MACHINES—
Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.

ROPES (Wire)—
Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.

ROUND AND OVAL HOLE CUTTING-OUT MACHINES—
Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.

RUBBER GOODS—
Heinke, C. E., & Co., 88, 89, Grange Road, Bermondsey, London, S.E.

RUBBER HOSE—
Heinke, C. E., & Co., 88, 89, Grange Road, Bermondsey, London, S.E.

RUSTLESS IRON—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

SAFE MANUFACTURERS—
Whitfield's Safe & Door Co., Oxford Street, Birmingham.

SALOON LIGHTS—
Callender's Cable & Construction Co., Ltd., Belvedere, Kent.
Laycock, W. S., Ltd., Victoria Works, Millhouses, Sheffield.

SALVAGE—
Alexander, W. H. J., St. John's Wharf, Wapping, E.

SANITARY FITTINGS AND APPLIANCES—
Levick, John, Alma Street, Aston, Birmingham.

SCREWING MACHINES—
Chatwin, Thos., Ltd., Gt. Tindal St., Birmingham.

SHAFTING—
Brown, John, & Co., Ltd., Atlas Works, Sheffield.
Darlington Forge Co., Ltd., Darlington.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

SHAPING MACHINES—
Greenwood & Batley, Ltd., Albion Works, Leeds.

SHEAVES—
Higginson & Co., 7, Hurst Street, Liverpool.

SHEERS, TRAVERSING (Land and Floating)—
Day, Summers & Co., Ltd., Northam Ironworks, Southampton

SHIP APPLIANCES—
Linkleter's Patent Ship Fittings Co., 20, Percy Street, Tynemouth.

SHIP BROKERS—
Walford, Leopold (London Ltd., 29, Gt. St. Helens, E.C.

SHIP BROKERS (Sale and Purchase)—
Hall, Edward, Cardiff.
Pinkney, Thos., & Sons, Sunderland.
Walford, Leopold (London) Ltd., 29, Gt. St. Helens, E.C.

BUYERS' GUIDE—*continued.*

SHIPBUILDERS—
Brown, John & Co., Ltd., Clydebank, Nr. Glasgow
Chambers, John, Ltd., Lowestoft.
Crichton, J. & Co., Saltney Shipyard, Chester.
Day, Summers & Co., Ltd., Northam Ironworks, Southampton.
Doxford, Wm., & Sons, Ltd., Sunderland.
Gray, Wm., & Co., Ltd., West Hartlepool.
Hamilton, Wm., & Co., Ltd., Port Glasgow.
Harland & Wolff, Ltd., Belfast.
Isherwood, J. W., 4, Lloyd's Avenue, London, E.C.
Simons, Wm., & Co., Ltd., Renfrew, Nr. Scotland.
Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne. [Westminster, S.W.
Thornycroft, John I., & Co., Ltd., Caxton House,
White, J. Samuel, & Co., Ltd., East Cowes, I.W
Workman Clark & Co., Ltd., Belfast.
Yarrow & Co., Ltd., Glasgow.

SHIP CONSTRUCTION—
Brown, John, & Co., Ltd., Clydebank, Nr. Glasgow.
Isherwood, J. W., 4, Lloyd's Avenue, London, E.C.
Simons, Wm., & Co., Ltd., Renfrew, Nr. Scotland.

SHIP FURNISHINGS & FITTINGS—
Laycock, W. S., Ltd., Victoria Works, Millhouses, Sheffield [Street, North Shields.
Linkleter's Patent Ship Fittings Co., Hudson
Loveridge, Ltd., Cardiff.
McGeoch, Wm., & Co., Ltd., 28, West Campbell Street, Glasgow. [Liverpool.
Metallic Valve Co., Colonial House, Water Street,
Stewart, Archibald, & Co., 40-48, Union Street,
Waygood-Otis, Ltd., Falmouth Road, S.E.

SHIP LAVATORIES—
Stewart, Archibald, & Co., 40-48, Union St., Glasgow

SHIP PLATES (Steel)—
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.

SHIP REPAIRERS—
Bailey, C. H., Newport, Mon.
Crichton, C. & H., Ltd., Huskisson Engine Works, Liverpool. [Southampton.
Day, Summers & Co., Ltd., Northam Ironworks,
Diamond, Thos., & Co., Cardiff.
Doxford, Wm., & Sons, Ltd., Sunderland.
Gray, Wm., & Co., Ltd., West Hartlepool.
Grayson, H. & C., Ltd., Royal Liver Building, Liverpool.
Harland & Wolff, Ltd., Belfast.
Hawthorn, R. & W., Leslie & Co., Ltd., Hebburn-on-Tyne.
Hill's Dry Docks & Engineering Co., Ltd., Cardiff.
Shennan, John, & Co., Ltd., Cardiff.
Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne.
Wallsend Slipway & Engineering Co., Ltd., Wallsend-on-Tyne.
Yarrow & Co., Ltd., Glasgow.

SHIPS' ELECTRIC FITTINGS—
McGeoch, Wm., & Co., Ltd., 28, West Campbell Street, Glasgow.
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.
Sunderland Forge & Engineering Co., Ltd., Sunderland.

SHIPS' LAUNDRIES—
Bradford, T., & Co., Salford, Manchester.

SHIPS' TELEGRAPHS—
Chadburn's (Ship) Telegraph Co., Ltd., Cyprus Road, Bootle, Lancs.
Robinson, A., & Co., Ltd., Bootle, Liverpool.

SIGNAL FLASHING AND CABIN LAMPS—
McGeoch, Wm., & Co., Ltd., 28, West Campbell Street, Glasgow.

SILICATE-COTTON SPECIALITIES— [Glasgow.
Walker, Jas., & Co., 11, Bishop Court, Anderston,

SKYLIGHT & LIFTING GEARS—
Low, Archibald, & Sons, Ltd., 78, Merkland Street, Partick, Glasgow.

SLAG WOOL (Silicate Cotton)—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.

SLEWING GEAR (for Ships' Derricks)—
Edina Manufacturing Co., 19b, Broad Wynd, Leith.

SMITHS' HEARTHS—
Keith, James, & Blackman Co., Ltd., 27, Farringdon Avenue, London, E.C.

SOLDER—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

SPEAKING TUBES—
Durham, Churchill & Co., Grimesthorpe, Sheffield.

SPELTER—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

SPIRAL SPRINGS—
Cockburns Ltd., Cardonald, Nr. Glasgow.
Sterne, L., & Co., Ltd., Crown Iron Works, Glasgow.

STAMPINGS—
Delta Metal Co., Ltd., East Greenwich.

STAYBOLTS—
Hingley & Sons, Ltd., Netherton Iron Works, Dudley, Staffs

STEAM-FITTING MANUFACTURERS—
Billington & Newton, Ltd., Longport, Staffs
Royles Ltd., Irlam, Nr. Manchester.

STEAM-HEATING—
Low, Archibald, & Sons, Ltd., 78, Merkland Street, Partick, Glasgow.
Royles Ltd., Irlam, Nr. Manchester.

STEAM KETTLES—
Royles Ltd., Irlam, Nr Manchester.

STEAM PIPES—
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.
Yorkshire Copper Works, Ltd., Leeds.

STEAM TRAPS—
Cockburns Ltd., Cardonald, Nr. Glasgow.
Royles Ltd., Irlam, Nr. Manchester.

STEAMSHIP SPECIALITIES—
Laycock, W. S., Ltd., Victoria Works, Millhouses, Sheffield. [Liverpool.
Metallic Valve Co., Colonial House, Water Street,

STEEL—
Brown, John, & Co., Atlas Works, Sheffield.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

STEEL BARGES
Crichton, J., & Co., Saltney Shipyard, Chester.
Watson, J. S., Gainsborough.

STEEL BOATS—
Crichton, J., & Co., Saltney Shipyard, Chester.
Leitch, John, & Co., The Ferry, Renfrew, Scotland.
Seamless Steel Boat Co., Ltd., Wakefield.

STEEL MAKERS—
Brown, John, & Co., Atlas Works, Sheffield.
Darlington Forge Co., Ltd., Darlington.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

STEEL PLATES AND SHEETS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.

STEERING-GEAR—
Brown Brothers & Co., Ltd., Rosebank Iron Works, Edinburgh.
Chambers, John, Ltd., Lowestoft.
Crichton, C. & H., Ltd., Huskisson Engine Works, Liverpool.
Hastie, John, & Co., Ltd., Greenock.
Higginson & Co., 7, Hurst Street, Liverpool.

STEERING GEAR (Buffers)—
Loveridge, Ltd., Cardiff.

STEERING TELEMOTORS—
Brown Brothers & Co., Ltd., Rosebank Iron Works, Edinburgh.
Mactaggart, Scott & Co., Ld., Loanhead, Edinburgh

STOCKS AND DIES—
Chatwin, Thos., Ltd., Gt. Tindal St., Birmingham.

STORES (Ship)—
Walker, Jas., & Co., 11, Bishop Court, Anderston, Glasgow.

STRONG ROOM MANUFACTURERS—
Whitfield's Safe & Door Co., Oxford St., Birmingham

STRONG ROOM DOOR MANUFACTURERS—
Whitfield's Safe & Door Co., Oxford St., Birmingham

STRUCTURAL ENGINEERS—
Braby, F., & Co., Ltd., Eclipse Works Glasgow.

SUPERHEATERS—
Central Marine Engine Works, West Hartlepool.
Superheater Corporation, Ltd., Palace Chambers, 9, Bridge Street, Westminster, S.W

SUSPENSION BULB FURNACE—
Leeds Forge Co., Ltd., Leeds.

SWITCHBOARDS—
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Holmes, J. H., & Co., Portland Road, Newcastle-
Mather & Platt, Ltd., Manchester. on-Tyne.
McGeoch, Wm., & Co., Ltd., 28, West Campbell Street, Glasgow.
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.
Sunderland Forge & Eng'r'ing Co., Ld., Sunderland.

SWITCHGEAR & INSTRUMENTS—
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester. on-Tyne.
Holmes, J. H., & Co., Portland Road, Newcastle-
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.

SYRENS—
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

TANK TOP COVERING—
Hamilton, Archd., & Co., Possilpark, Glasgow.
Wades Deeve Bitumastic Ltd., 5, St. Nicholas Buildings, Newcastle-on-Tyne.

TANKS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.
Mather & Platt, Ltd., Manchester.

TARPAULINS—
Speedings Ltd., Sail Works, Sunderland.

TELEPHONES—
Graham, Alfred, St. Andrew's Works, Crofton Park Road, S.E.
McGeoch, Wm., & Co., Ltd., 28, West Campbell Street, Glasgow.

TIMEPIECES—
Chadburn's (Ship) Telegraph Co., Ltd., Cyprus Road, Bootle, Lancs.

TOOL STEEL—
Brown, John, & Co., Atlas Works, Sheffield.

TOWAGE—
Alexander, W. H. L., St. John's Wharf, Wapping, E.
Tilbury Contracting & Dredging Co., Ltd., Queen Anne's Chambers, Westminster, London, S.W.

TUBE PLATE CUTTING-OUT MACHINES—
Campbells & Hunter, Ld., Dolphin Foundry, Leeds.

TUBES—
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.
Royles Ltd., Irlam, Nr. Manchester.
The Yorkshire Copper Works, Ltd., Leeds.

TUBES (Brass and Copper)—
Yorkshire Copper Works, Ltd., Leeds.

TURBINE OIL—
Rimer Bros., Newcastle-on-Tyne.

TURBINES (Auxiliary)—
Belliss & Morcom, Ltd., Birmingham.
British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Greenwood & Batley, Ltd., Albion Works, Leeds.
Mather & Platt, Ltd., Manchester.

TURBINES (Propulsive)—
British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Brown, John, & Co., Ltd., Clydebank, nr. Glasgow.
Gray, Wm., & Co., Ltd., West Hartlepool.
Harland & Wolff, Ltd., Belfast.
Hawthorn, R. & W., Leslie & Co., Ltd., St. Peter's, Newcastle-on-Tyne.
Howden, James, & Co., Ltd., Scotland Street, Glasgow.
Swan, Hunter & Wigham Richardson, Ltd., Wallsend-on-Tyne.
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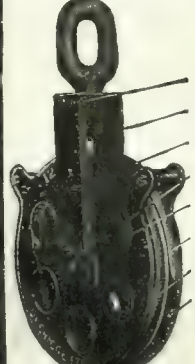

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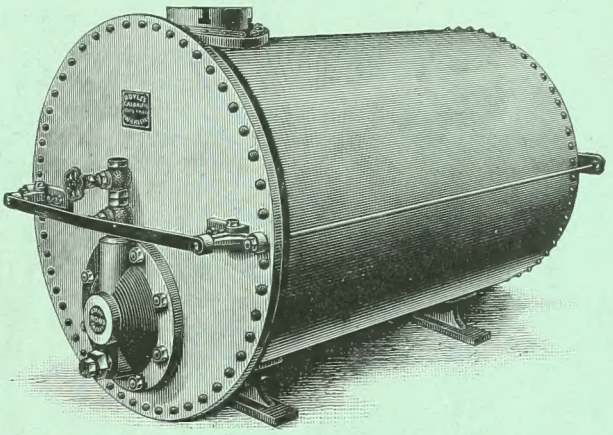

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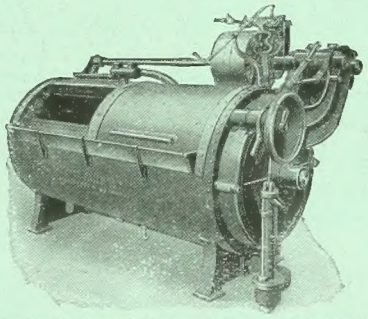

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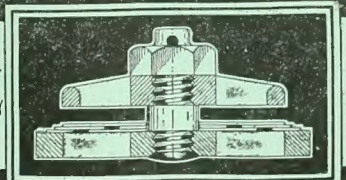

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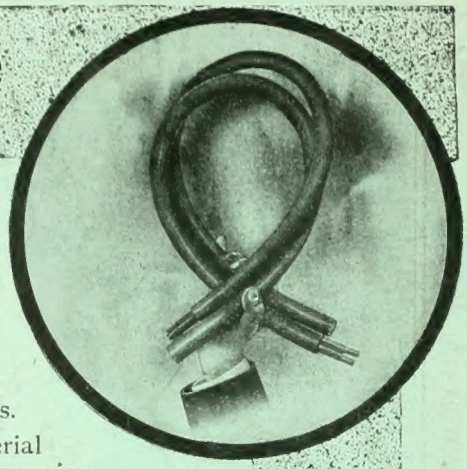

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